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=> d all 1-
YOU HAVE REQUESTED DATA FROM 3 ANSWERS - CONTINUE? Y/(N):y

L1   ANSWER 1 OF 3  REGISTRY  COPYRIGHT 2004 ACS on STN
RN   64085-15-0  REGISTRY
ED   Entered STN:  16 Nov 1984
CN   Niobium alloy, base, Nb 55,Re 20,Zr 20,Hf 5 (9CI)  (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN   Hafnium alloy, nonbase, Nb 55,Re 20,Zr 20,Hf 5
CN   Rhenium alloy, nonbase, Nb 55,Re 20,Zr 20,Hf 5
CN   Zirconium alloy, nonbase, Nb 55,Re 20,Zr 20,Hf 5
MF   Hf . Nb . Re . Zr
CI   AYS
LC   STN Files:   CA, CAPLUS, IFICDB, IFIPAT, IFIUDB, USPATFULL

Component   Component      Component
             Percent    Registry Number
=========+=============+===============
    Nb          55          7440-03-1
    Re          20          7440-15-5
    Zr          20          7440-67-7
    Hf           5          7440-58-6

               1 REFERENCES IN FILE CA (1907 TO DATE)
               1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE  1

AN   87:139937  CA
TI   Nitrided materials
IN   Van Thyne, Ray J.; Rausch, John J.
PA   Surface Technology Corp., USA
SO   U.S., 11 pp.
     CODEN: USXXAM
DT   Patent
LA   English
IC   C22C027-02
NCL  148031500
CC   56-2 (Nonferrous Metals and Alloys)
FAN.CNT 1
     PATENT NO.       KIND  DATE          APPLICATION NO.  DATE
     ---------------  ----  --------      ---------------  --------
PI   US 4026730        A    19770531      US 1974-525447   19741120
PRAI US 1970-99664     19701218
     US 1973-324641    19730118
     US 1973-324680    19730118
     US 1973-324769    19730118
     US 1973-99663     19731218
AB   Refractory alloy cutting tools are formed and nitrided to produce a graded
     microhardness zone of .apprx.3000 0.5 mil below the surface and
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continuously decreasing at larger depths. The alloy consists of (1) 55-85% Nb, V, and/or Ta (2) Hf 5-35 with (Hf + Ti + Zr) 10-40 and (Ti + Zr) ≥5%,(3) 2-40% Mo, W, Re, and/or Cr. N pickup is 5-25 mg/cm2, and the resulting tool removes ≥2 in.3 steel hardened to Rockwell C44 at rates of 750 surface ft/min. Thus, Nb-15 Hf-5Ti-10 Mo-8% Cr [64085-18-3] was nitrided 2 h at 2450°F. The microhardness of the resulting tool was 2860 and 500 at depths of 0.5 and 4 mils, resp.

ST niobium alloy tool nitriding

IT Nitridation
(of refractory alloy cutting tools)

IT Tools
(cutting, refractory alloys for, nitriding of)

IT 64084-88-4 64084-89-5 64084-90-8 64084-91-9 64084-92-0
64084-93-1 64084-94-2 64084-95-3 64084-96-4 64084-97-5
64084-98-6 64084-99-7 64085-06-9 64085-07-0 64085-08-1
64085-09-2 64085-10-5 64085-11-6 64085-12-7 64085-13-8
64085-14-9 64085-15-0 64085-16-1 64085-17-2 64085-18-3
RL: TEM (Technical or engineered material use); USES (Uses)
(for cutting tools, nitriding of)

L1 ANSWER 2 OF 3 REGISTRY COPYRIGHT 2004 ACS on STN
RN 64084-99-7 REGISTRY
ED Entered STN: 16 Nov 1984
CN Niobium alloy, base, Nb 60,Re 20,Hf 15,Ti 5 (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN Hafnium alloy, nonbase, Nb 60,Re 20,Hf 15,Ti 5
CN Rhenium alloy, nonbase, Nb 60,Re 20,Hf 15,Ti 5
CN Titanium alloy, nonbase, Nb 60,Re 20,Hf 15,Ti 5
MF Hf . Nb . Re . Ti
CI AYS
LC STN Files: CA, CAPLUS, IFICDB, IFIPAT, IFIUDB, USPATFULL

Component	Component Percent	Component Registry Number
Nb	60	7440-03-1
Re	20	7440-15-5
Hf	15	7440-58-6
Ti	5	7440-32-6

1 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1

AN 87:139937 CA
TI Nitrided materials
IN Van Thyne, Ray J.; Rausch, John J.
PA Surface Technology Corp., USA
SO U.S., 11 pp.

CODEN: USXXAM
DT Patent
LA English
IC C22C027-02
NCL 148031500
CC 56-2 (Nonferrous Metals and Alloys)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4026730	A	19770531	US 1974-525447	19741120
PRAI	US 1970-99664	19701218			
	US 1973-324641	19730118			
	US 1973-324680	19730118			
	US 1973-324769	19730118			
	US 1973-99663	19731218			

AB Refractory alloy cutting tools are formed and nitrided to produce a graded microhardness zone of .apprx.3000 0.5 mil below the surface and continuously decreasing at larger depths. The alloy consists of (1) 55-85% Nb, V, and/or Ta (2) Hf 5-35 with (Hf + Ti + Zr) 10-40 and (Ti + Zr) ≥5%,(3) 2-40% Mo, W, Re, and/or Cr. N pickup is 5-25 mg/cm2, and the resulting tool removes ≥2 in.3 steel hardened to Rockwell C44 at rates of 750 surface ft/min. Thus, Nb-15 Hf-5Ti-10 Mo-8% Cr [64085-18-3] was nitrided 2 h at 2450°F. The microhardness of the resulting tool was 2860 and 500 at depths of 0.5 and 4 mils, resp.
ST niobium alloy tool nitriding
IT Nitridation
(of refractory alloy cutting tools)
IT Tools
(cutting, refractory alloys for, nitriding of)
IT 64084-88-4 64084-89-5 64084-90-8 64084-91-9 64084-92-0
64084-93-1 64084-94-2 64084-95-3 64084-96-4 64084-97-5
64084-98-6 64084-99-7 64085-06-9 64085-07-0 64085-08-1
64085-09-2 64085-10-5 64085-11-6 64085-12-7 64085-13-8
64085-14-9 64085-15-0 64085-16-1 64085-17-2 64085-18-3
RL: TEM (Technical or engineered material use); USES (Uses)
(for cutting tools, nitriding of)

L1 ANSWER 3 OF 3 REGISTRY COPYRIGHT 2004 ACS on STN
RN 64084-92-0 REGISTRY
ED Entered STN: 16 Nov 1984
CN Niobium alloy, base, Nb 60,Hf 20,Re 20 (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN Hafnium alloy, nonbase, Nb 60,Hf 20,Re 20
CN Rhenium alloy, nonbase, Nb 60,Hf 20,Re 20
MF Hf . Nb . Re
CI AYS
LC STN Files: CA, CAPLUS, IFICDB, IFIPAT, IFIUDB, USPATFULL

Component	Component Percent	Component Registry Number

Nb	60	7440-03-1
Hf	20	7440-58-6
Re	20	7440-15-5

1 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1

AN 87:139937 CA
TI Nitrided materials
IN Van Thyne, Ray J.; Rausch, John J.
PA Surface Technology Corp., USA
SO U.S., 11 pp.
CODEN: USXXAM
DT Patent
LA English
IC C22C027-02
NCL 148031500
CC 56-2 (Nonferrous Metals and Alloys)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4026730	A	19770531	US 1974-525447	19741120
PRAI	US 1970-99664	19701218			
	US 1973-324641	19730118			
	US 1973-324680	19730118			
	US 1973-324769	19730118			
	US 1973-99663	19731218			

AB Refractory alloy cutting tools are formed and nitrided to produce a graded microhardness zone of .apprx.3000 0.5 mil below the surface and continuously decreasing at larger depths. The alloy consists of (1) 55-85% Nb, V, and/or Ta (2) Hf 5-35 with (Hf + Ti + Zr) 10-40 and (Ti + Zr) ≥5%,(3) 2-40% Mo, W, Re, and/or Cr. N pickup is 5-25 mg/cm2, and the resulting tool removes ≥2 in.3 steel hardened to Rockwell C44 at rates of 750 surface ft/min. Thus, Nb-15 Hf-5Ti-10 Mo-8% Cr [64085-18-3] was nitrided 2 h at 2450°F. The microhardness of the resulting tool was 2860 and 500 at depths of 0.5 and 4 mils, resp.
ST niobium alloy tool nitriding
IT Nitridation
(of refractory alloy cutting tools)
IT Tools
(cutting, refractory alloys for, nitriding of)
IT 64084-88-4 64084-89-5 64084-90-8 64084-91-9 64084-92-0
64084-93-1 64084-94-2 64084-95-3 64084-96-4 64084-97-5
64084-98-6 64084-99-7 64085-06-9 64085-07-0 64085-08-1
64085-09-2 64085-10-5 64085-11-6 64085-12-7 64085-13-8
64085-14-9 64085-15-0 64085-16-1 64085-17-2 64085-18-3
RL: TEM (Technical or engineered material use); USES (Uses)

(for cutting tools, nitriding of)

Print selected from Online session 01/04/2004Page 1

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     (FILE 'HOME' ENTERED AT 15:05:04 ON 01 APR 2004)

     FILE 'REGISTRY' ENTERED AT 15:11:20 ON 01 APR 2004
                E  NB.PD.ZR?/RC
                E NB.PD?/RC
                E NB.RU?/RC
                E NB.RU/RC
                E NB.RE/RC
L1            3 S E11 OR E12 OR E25
                E NB.PT/RC
                E NB.PT.HF/RC
                E NB.PT.ZR/RC
                E NB.AU/RC
                E NB.AU.ZR/RC
L2            1 S E8
                E NB.AU.HF/RC
L3            1 S E3
L4            0 S NB.RH.HF/RC
                E NB.RH.HF/RC
                E NB.HR.ZR/RC
                E NB.RH.HF/RC
                E NB.RH.ZR/RC

     FILE 'CAPLUS' ENTERED AT 15:30:43 ON 01 APR 2004

=> s l1 or l3
              1 L1
              1 L3
L5            2 L1 OR L3

=> d ibib ab it 1-
YOU HAVE REQUESTED DATA FROM 2 ANSWERS - CONTINUE? Y/(N):y

L5   ANSWER 1 OF 2  CAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:         1999:113970  CAPLUS
DOCUMENT NUMBER:          130:227794
TITLE:                    Stents comprising shape-memory alloys
INVENTOR(S):              Duerig, Thomas; Stockel, Dieter; Burpee, Janet
PATENT ASSIGNEE(S):       Nitinol Development Corporation, USA
SOURCE:                   Jpn. Kokai Tokkyo Koho, 7 pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.        KIND  DATE           APPLICATION NO.  DATE
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JP 11042283	A2	19990216	JP 1998-131036	19980424
PRIORITY APPLN. INFO.:			US 1997-846130	19970425

AB The stents are used in lumens of human or animals and have tubular bodies comprising shape-memory alloys, which are treated to show high elasticity and inflection point in stress-strain curve under load and contain Ni, Ti, and .apprx.3-20 atomic% elements chosen from Nb, Hf, Ta, W, and Au. The stents can be compressed for insertion and recover the initial shape to be brought in contact with lumen and support it. The alloys show ratio of stress at inflection point under load to that without load .apprx.2.5:1 or difference between stress at inflection point under load and that without load .apprx.250 MPa after deformation to 10% strain. A stent comprising Ni-Ti-Nb alloy (44:47:9) is illustrated.

IT Shape memory alloys
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(stents comprising shape-memory alloys)

IT Medical goods
(stents; stents comprising shape-memory alloys)

IT 221101-42-4 **221101-43-5**
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(stents comprising shape-memory alloys)

L5 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1977:539937 CAPLUS
DOCUMENT NUMBER: 87:139937
TITLE: Nitrided materials
INVENTOR(S): Van Thyne, Ray J.; Rausch, John J.
PATENT ASSIGNEE(S): Surface Technology Corp., USA
SOURCE: U.S., 11 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4026730	A	19770531	US 1974-525447	19741120
PRIORITY APPLN. INFO.:			US 1970-99664	19701218
			US 1973-324641	19730118
			US 1973-324680	19730118
			US 1973-324769	19730118
			US 1973-99663	19731218

AB Refractory alloy cutting tools are formed and nitrided to produce a graded microhardness zone of .apprx.3000 0.5 mil below the surface and continuously decreasing at larger depths. The alloy consists of (1) 55-85% Nb, V, and/or Ta (2) Hf 5-35 with (Hf + Ti + Zr) 10-40 and (Ti + Zr) ≥5%,(3) 2-40% Mo, W, Re, and/or Cr. N pickup is 5-25 mg/cm2, and the resulting tool removes ≥2 in.3 steel hardened to Rockwell C44 at rates of 750 surface ft/min. Thus, Nb-15 Hf-5Ti-10 Mo-8% Cr [64085-18-3] was nitrided 2 h at 2450°F. The microhardness of the

resulting tool was 2860 and 500 at depths of 0.5 and 4 mils, resp.

IT Nitridation
(of refractory alloy cutting tools)

IT Tools
(cutting, refractory alloys for, nitriding of)

IT 64084-88-4 64084-89-5 64084-90-8 64084-91-9 **64084-92-0**
64084-93-1 64084-94-2 64084-95-3 64084-96-4 64084-97-5
64084-98-6 **64084-99-7** 64085-06-9 64085-07-0 64085-08-1
64085-09-2 64085-10-5 64085-11-6 64085-12-7 64085-13-8
64085-14-9 **64085-15-0** 64085-16-1 64085-17-2 64085-18-3
RL: TEM (Technical or engineered material use); USES (Uses)
(for cutting tools, nitriding of)

IT 74-82-8, Methane, reactions 74-85-1, Ethylene, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, electrocatalytic, on **gas diffusion** electrodes, electrode composition effect on)

IT 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction of, electrocatalytic, on **gas diffusion** electrodes, electrode composition effect on)

L8 ANSWER 18 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1992:89259 CAPLUS
DOCUMENT NUMBER: 116:89259
TITLE: Amorphous cobalt and nickel **alloy** catalysts for **purification** of exhaust **gases**
INVENTOR(S): Hashimoto, Koji; Teruchi, Kyohiro; Habasaki, Hiroki; Kawashima, Asahi; Asami, Katsuhiko.
PATENT ASSIGNEE(S): Daiki Engineering Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 03126846	A2	19910530	JP 1989-262986	19891011
JP 2897958	B2	19990531		

PRIORITY APPLN. INFO.: JP 1989-262986 19891011

AB The alloys contain **Nb** and or Ta 20-70 and/or Ti and/or **Zr** 20-80, **Ru**, **Pd**, Rh, **Pt**, and/or Ir 05-20 atomic%, and Ni and/or Co balance, and are activated by immersion in **HF**. The catalysts work at relatively low temps. Thus, a Ni **alloy** containing 30 atomic% Ta and 2 atomic% Rh was remeleted in Ar and fast cooled on a rotating roll to obtain amorphous flakes (thickness 0101-0.05, width 1-3, length 3-20 mm). The amorphous flakes were immersed in 46.5% **HF** for 300-900 s for activation. The activated flakes (0.5 g) were filled into a quartz tube (inner diameter 8, length 50 mm) and the tube was placed into a furnace. N containing 100 ppm NO and 100 ppm CO was passed through the flakes in the tube at 100 mm/min and the leaving **gases** were analyzed by **gas** chromatog. The temperature for complete conversion of NO and CO into NO2 and CO2 was 165°.

IT Exhaust **gases**
(**purification** of, nickel-rhodium-tantalum **alloy** catalyst for)

IT 109762-72-3 134762-94-0 134762-95-1 134762-97-3 134762-98-4
134763-00-1 134763-01-2 134763-02-3 134763-03-4 134763-04-5
134763-05-6 134782-60-8 134782-61-9 134782-62-0 134818-71-6
134818-72-7 134818-73-8 134818-74-9 134818-75-0 134818-77-2
134818-78-3 137922-43-1 137949-94-1 137949-95-2 137949-96-3

138985-94-1 138985-95-2 138985-96-3 138985-97-4
RL: CAT (Catalyst use); USES (Uses)
(amorphous catalyst, for conversion of carbon monoxide and nitric oxide in exhaust **gases**)

L8 ANSWER 19 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1989:558747 CAPLUS
DOCUMENT NUMBER: 111:158747
TITLE: Metallic (nickel **alloy**) parts, especially **gas** turbine blades with multilayer protective coating
INVENTOR(S): Schmitz, Friedhelm; Czech, Norbert; Deblon, Bruno
PATENT ASSIGNEE(S): Siemens A.-G., Fed. Rep. Ger.
SOURCE: PCT Int. Appl., 19 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 8907159	A1	19890810	WO 1989-DE23	19890119
W: JP, US				
RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
EP 397731	A1	19901122	EP 1989-901530	19890119
EP 397731	B1	19930414		
R: CH, DE, FR, GB, IT, LI, SE				
JP 03503184	T2	19910718	JP 1989-501389	19890119
PRIORITY APPLN. INFO.:			DE 1988-3803517	19880205
			WO 1989-DE23	19890119

AB The coating includes an inner layer effective at 600-800°, a 2nd layer affording optimal protection at 800-900°, and an outermost thermal barrier layer. The 1st layer whose thickness is >0.130 mm is a Cr **diffusion** layer containing ≥10% Fe and/or Mn and preferably 20-30% Fe. The 2nd layer contains Cr 15-40 (preferably 20-30); Al 3-15 (7-12); ≥1 element from the group of rare earth metals, Y, Ta, **Hf**, Sc, **Zr**, **Nb**, **Re**, and Si 0.2-3 (.apprx.0.7%); and balance Co and/or Ni. Both layers are deposited by low-pressure plasma spraying. The thermal barrier layer consists of Y_2O_3-containing ZrO_2. A **diffusion**-barrier layer of TiN is formed between the substrate and the 1st layer and between the 1st and 2nd layers. The overall coating thickness is >0.3 mm.

IT Rare earth metals, uses and miscellaneous
RL: USES (Uses)
(turbine blades from nickel **alloy** with coating layer containing)

IT Turbines
(blades, nickel **alloy**, multilayer-coated)

IT Nickel **alloy**, base
RL: USES (Uses)

(turbine blades from multilayer-coated)
IT 7429-90-5, Aluminum, uses and miscellaneous 7440-02-0, Nickel, uses and miscellaneous 7440-03-1, Niobium, uses and miscellaneous 7440-15-5, Rhenium, uses and miscellaneous 7440-20-2, Scandium, uses and miscellaneous 7440-21-3, Silicon, uses and miscellaneous 7440-25-7, Tantalum, uses and miscellaneous 7440-48-4, Cobalt, uses and miscellaneous 7440-58-6, Hafnium, uses and miscellaneous 7440-65-5, Yttrium, uses and miscellaneous 7440-67-7, Zirconium, uses and miscellaneous 25583-20-4, Titanium nitride
RL: USES (Uses)
(turbine blades from nickel **alloy** with coating layer containing)
IT 79153-60-9
RL: USES (Uses)
(turbine blades from nickel **alloy** with coating layer of)
IT 1314-23-4, Zirconia, uses and miscellaneous
RL: USES (Uses)
(turbine blades from nickel **alloy** with coating layer of yttria and)
IT 1314-36-9, Yttria, uses and miscellaneous
RL: USES (Uses)
(turbine blades from nickel **alloy** with coating layer of zirconia and)

L8 ANSWER 20 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1988:560529 CAPLUS
DOCUMENT NUMBER: 109:160529
TITLE: Electrophotographic photoreceptor containing **diffusion**-blocking layer
INVENTOR(S): Ohno, Toshiyuki; Tamahashi, Kunihiro; Chigasaki, Mitsuo
PATENT ASSIGNEE(S): Hitachi, Ltd., Japan
SOURCE: Eur. Pat. Appl., 12 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 262807	A1	19880406	EP 1987-307723	19870902
EP 262807	B1	19930210		
R: DE, FR, GB, IT, NL				
JP 63218967	A2	19880912	JP 1987-215410	19870831
JP 06077158	B4	19940928		
US 4804606	A	19890214	US 1987-92304	19870902

PRIORITY APPLN. INFO.: JP 1986-205974 19860903
AB An electrophotog. photoreceptor is comprised of a conductive substrate made of Al, an Al-Si-Mg **alloy**, super duralamine, or extra super duralamine, a **diffusion**-blocking layer (0.005-5 μm thick)

prepared from Cr, a nitride of Ti, Ta, or **Hf**, a silicide of **Pt**, Ni, **Pd**, Ti, **Hf**, Ta, W, V, **Nb**, Mo, or **Zr**, or a carbide of W, Ti, Mo, **Hf**, V, **Nb**, or Ta, and a hydrogenated amorphous Si photoconductive layer. The decrease in specific resistance of the photoconductive layer caused by the **diffusion** of the substrate material into the photoconductive layer is prevented by the presence of the **diffusion**-blocking layer and the photosensitivity of the photoreceptor to a **gas** or a semiconductor laser is improved. Thus, an Al drum was vacuum-deposited with a 100-nm Ti nitride **diffusion**-blocking layer, a 100-nm hydrogenated amorphous Si carbide barrier layer, a 20-μm hydrogenated amorphous Si lower photoconductive layer, a hydrogenated amorphous Si-Ge upper photoconductive layer, and a 500-nm hydrogenated amorphous Si carbide top layer to give an electrophotog. photoreceptor which showed improved photosensitivity to a 600-650 nm **gas** laser or a 780-800 nm semiconductor laser as compared to a control without the **diffusion**-blocking layer.

IT Electrophotographic plates
(with **diffusion**-blocking layer for preventing resistance decrease in photoconducting layer and improved photosensitivity to lasers)

IT 7440-21-3, Silicon, uses and miscellaneous
RL: USES (Uses)
(amorphous, hydrogenated, photoconductive layer from, for electrophotog. photoreceptor with **diffusion**-blocking layer)

IT 409-21-2, Silicon carbide, uses and miscellaneous
RL: USES (Uses)
(barrier and protective layers from, for amorphous hydrogenated silicon electrophotog. plate with **diffusion**-blocking layer)

IT 7440-47-3, Chromium, uses and miscellaneous 11104-85-1, Molybdenum silicide 11113-78-3, Palladium silicide 11129-80-9, Platinum silicide 12033-62-4, Tantalum nitride 12069-85-1, Hafnium carbide 12069-94-2, Niobium carbide 12070-06-3, Tantalum carbide 12070-08-5, Titanium carbide 12070-10-9, Vanadium carbide 12070-12-1, Tungsten carbide 12627-41-7, Tungsten silicide 12627-57-5, Molybdenum carbide 12738-91-9, Titanium silicide 25583-20-4, Titanium nitride 25817-87-2, Hafnium nitride 37189-51-8, Zirconium silicide 39336-13-5, Niobium silicide 39467-10-2, Nickel silicide 52037-56-6, Vanadium silicide 52953-72-7, Tantalum silicide 60304-33-8, Hafnium silicide
RL: USES (Uses)
(**diffusion**-blocking layer from, for electrophotog. plate with aluminum support and hydrogenated amorphous silicon photoconductive layer)

IT 7440-56-4, Germanium, uses and miscellaneous
RL: USES (Uses)
(photoconductive layer from amorphous hydrogenated mixture of silicon and, for electrophotog. photoreceptor with **diffusion**-blocking layer)

IT 107471-90-9
RL: USES (Uses)

(support, for electrophotog. plate with **diffusion**-blocking layer)
IT 7429-90-5, Aluminum, uses and miscellaneous
RL: USES (Uses)
(support, for electrophotog. plate, **diffusion**-blocking layer for)

L8 ANSWER 21 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1971:439792 CAPLUS
DOCUMENT NUMBER: 75:39792
TITLE: **Diffusion** coating method for protecting metallic articles
INVENTOR(S): Bungardt, Karl; Lehnert, Guenter; Meinhardt, Helmut
PATENT ASSIGNEE(S): Deutsche Edelstahlwerke A.-G.
SOURCE: Ger. Offen., 13 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 1955203	A	19710513	DE 1969-1955203	19691103
DE 1955203	B	19711125		
CH 552071	A	19740731	CH 1970-12064	19700811
FR 2071753	A5	19710917	FR 1970-36518	19701009
GB 1318609	A	19730531	GB 1970-49270	19701016
ZA 7007104	A	19710825	ZA 1970-7104	19701019
NL 7015945	A	19710505	NL 1970-15945	19701030
NO 126807	B	19730326	NO 1970-4160	19701102
SE 358419	B	19730730	SE 1970-14735	19701102
JP 48034292	B4	19731020	JP 1970-97091	19701104

PRIORITY APPLN. INFO.: DE 1969-1955203 19691103

AB Stationary **gas** turbine vanes are made corrosion-, heat-, and thermal shock-resistant by coating the vanes with a **diffused** layer of Cr, Si, Al, or **Pt**. The vanes made of high-temperature resistant Ni-, Ni-Co-, or Co alloys are coated by vapor phase deposition, flame-spraying, cladding, rolling, or electrolysis, followed by annealing to allow **diffusion** of the coating into the base metal. Coatings of 2-10 μ provide the desired resistance, which can be further increased by depositing an addnl. coating on the surface of the **diffused** layer. Thus, the surface of an **alloy** sample containing C 0.097, Mn <0.02, S 0.003, P 0.005, Cr 12.9, Mo 4.09, Al 5.78, B 0.0097, Co <0.02, Cu <0.02, **Zr** 0.092, **Nb** 2.60, Ti 0.94, Fe 0.16%, and Ni balance, was anodically cleaned and then subjected to electrolysis in a bath containing H_2PtCl_6 13, $(NH_4)_3PO_4$ 45, and Na_2HPO_4 240 g/l., at 75° and at a c.d. of 2 A/dm2 to produce a **Pt** coating of 6 μ. The coated **alloy** was then heat treated for 2 hr at 260°, followed by annealing at 450° for 3 hr. The

Pt-coated **alloy** was then coated with a layer of Cr by embedding the **alloy** in a powder composition containing Cr 12.5, ferrochromium 12.5, and Al_2O_3 75 weight % (the Al_2O_3 contained a 0.2% $CrCl_3$). The **alloy**-powder composition was kept at 1100° for 10 hr and a Cr **diffusion** coating of 80 μ was obtained.

IT Turbines
(cementation of nickel **alloy**, with chromium and platinum)

IT Nickel alloys, base
(chromium-aluminum-molybdenum-, cementation of, with chromium and platinum for turbines)

IT Aluminum alloys, containing
Chromium alloys, containing
Molybdenum alloys, containing
Niobium alloys, containing
Tantalum alloys, containing
(nickel-, cementation of, with chromium and platinum for turbines)

IT Cementation
(of nickel alloys for **gas** turbines, with chromium and platinum)

IT Chromizing
(of nickel alloys, platinum effect on, for turbines)

IT 7440-06-4, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(cementation with, of nickel alloys for turbines)

L8 ANSWER 22 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:	1967:424850 CAPLUS
DOCUMENT NUMBER:	67:24850
TITLE:	Dry corrosion of cobalt-chromium alloys at high temperature. Influence of ternary additions
AUTHOR(S):	Davin, A.; Coutsouradis, D.; Habraken, Louis
CORPORATE SOURCE:	Centre Natl. Rech. Met., Leige, Belg.
SOURCE:	Cobalt (English Edition) (1967), 35(69-77), 69-77 CODEN: COBAAP; ISSN: 0010-0048
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB The corrosion resistance was investigated of Co-10 to 35% Cr alloys, and of their ternaries with either Mo, W, **Zr**, Fe, Ni, **Nb**, Ta, Ce, B, Y, or **Re**. The binary alloys were tested in an H_2S containing atmospheric as well as still air, and in synthetic atmospheric simulating combustion **gases**, as such, and with S and NaCl. Corrosion was generally controlled by the outward **diffusion** of cations. The sulfidation resistance of Co-Cr alloys was not appreciably modified by ternary addns., except that the Co-10 Cr-1Al **alloy** had improved resistance at 800°. On oxidation of Cr-rich alloys at high temperature, the protective Cr_2O_3 spalled off during the test. This was not observed in Ta-, W-, Al-, **Zr**-, Ti-, Ce-, and **Nb**-containing Co-Cr alloys. Ta improved considerably the oxidation resistance of low Cr alloys. In combustion **gases** the corrosion resistance of the alloys was reduced by the presence of NaCl. High Cr contents are necessary, and Al,

Ta, and Y are beneficial.

IT Chromium alloys, containing
(aluminum-cobalt-, cobalt-tantalum-, and yttrium-containing cobalt-, corrosion resistance of, in hydrogen sulfide atmospheric, sodium chloride effect on)

IT Cobalt alloys, base
(chromium-, corrosion resistance of yttrium-containing, in hydrogen sulfide atmospheric, sodium chloride effect on)

IT Cobalt alloys, base
(chromium-aluminum-, corrosion resistance of, in hydrogen sulfide atmospheric, sodium chloride effect on)

IT Aluminum alloys, containing
Tantalum alloys, containing
(chromium-cobalt-, corrosion resistance of, in hydrogen sulfide atmospheric, sodium chloride effect on)

IT Cobalt alloys, base
(chromium-tantalum-, corrosion resistance of, in hydrogen sulfide atmospheric, sodium chloride effect on)

IT 7783-06-4, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(corrosion by, of chromium-cobalt alloys, effect of alloying elements and sodium chloride on)

IT 7647-14-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(corrosion of chromium-cobalt alloys by hydrogen sulfide atmospheric containing)

IT 7440-65-5, properties
RL: PRP (Properties)
(corrosion resistance of chromium-cobalt alloys containing, in hydrogen sulfide atmospheric, sodium chloride effect on)

L8 ANSWER 23 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1966:428056 CAPLUS
DOCUMENT NUMBER: 65:28056
ORIGINAL REFERENCE NO.: 65:5168c-d
TITLE: Transition metal hydrides
INVENTOR(S): Oka, Akira
SOURCE: 5 pp.
DOCUMENT TYPE: Patent
LANGUAGE: Unavailable
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 1410887		19650910	FR	

PRIORITY APPLN. INFO.: JP 19631010

AB Pure H for producing the hydrides is prepared by **diffusion** through a **Pd alloy** membrane at -70° as given in U.S. 2,773,561 (CA 51, 4604b). E.g., 99.9% Ti is degassed in vacuo in a stainless steel tube at 800°, and then hydrogenated at 450°

at atmospheric pressure. If desired, a bed of Ti may be used for the **gas purification.** The TiH_2 powder may be powdered in the absence of O to aerosol dimensions, in which form it is thermally decomposable to pyrophoric Ti at 500°. Similar prepns. may be made from **Zr**, **Hf**, V, **Nb**, or Ta. **Alloy** frits may be useful for superconductors. Steel may be coated with alc. suspensions, and heat treated to give non-corrodible surfaces.

IT Transition metal hydrides
(manufacture of, and metal powder manufacture from)

IT Coating(s)
(of iron, with transition metal hydrides)

IT Conductors, electric
(super-, sintering of, hydrides in)

IT 12770-26-2, Hafnium hydride, HfH_2
(manufacture of, and Hf powder manufacture from)

IT 13981-86-7, Niobium hydride, NbH
(manufacture of, and Nb powder manufacture from)

IT 13981-95-8, Tantalum hydride, TaH
(manufacture of, and Ta powder manufacture from)

IT 7704-98-5, Titanium hydride, TiH_2
(manufacture of, and Ti powder manufacture therefrom)

IT 13966-93-3, Vanadium hydride, VH
(manufacture of, and V powder manufacture from)

IT 7704-99-6, Zirconium hydride, ZrH_2
(manufacture of, and Zr powder manufacture therefrom)

IT 7440-32-6, Titanium
(powdered, manufacture from TiH_2)

IT 7440-58-6, Hafnium
(powdered, manufacture of, from HfH_2)

IT 7440-62-2, Vanadium
(powdered, manufacture of, from VH)

IT 7440-25-7, Tantalum
(powder, manufacture from TaH, compression after)

IT 7440-03-1, Niobium
(process metallurgy of, from niobium hydride (NbH))

L8 ANSWER 24 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1965:79813 CAPLUS
DOCUMENT NUMBER: 62:79813
ORIGINAL REFERENCE NO.: 62:14121h,14122a
TITLE: Migration of gaseous and solid fission products in iron-20 chromium and iron-29 nickel-13 chromium
AUTHOR(S): Bauer, Arthur A.; Bugl, Josef; Cocks, George G.; Elleman, Thomas S.; Howes, James E., Jr.; Morrison, David L.
SOURCE: U.S. At. Energy Comm. (1964), BMI-1696, 40 pp.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Fission-**gas** migration in Fe-20 weight % Cr was studied by measurement of 133Xe release from the surface of recoil-impregnated foils

during postirradiation heating, by measurement of the concentration gradient during postirradiation annealing, by measurement of the release during irradiation, and by electron microscopy. Observed effects are consistent with a mechanism where a **gas**-atom clustering occurs during postirradiation annealing. In body-centered cubic, Fe-20 weight % Cr, Te, **Ru**, and Mo **diffuse** with rates normal for vacancy-**diffusion** processes. Ce, Ba, I, and **Zr-Nb** **diffuse** at lower rates than expected for self-**diffusion.** In face-centered cubic, Fe-29 weight % Ni-13 weight % Cr, these lower **diffusion** rates were found for all elements. Preliminary expts. indicate that **diffusion** in **Zr** may proceed by both grain boundary and volume **diffusion** processes. Under normal operating conditions, fission **gases** will not be released through intact cladding and coolant contamination by fission product **diffusion** through the cladding may be a problem at temps. several 100 degrees higher than now used.

IT Fission
(fragments or products of, **diffusion** in Cr-Fe and Cr-Fe-Ni alloys)

IT Reactors, nuclear
(fuels or fuel elements, Cr **alloy** claddings for, fission-product **diffusion** in)

IT **Diffusion**
(of fission products, in Cr-Fe and Cr-Fe-Ni alloys)

IT 7440-18-8, Ruthenium
(**diffusion** in Cr-Fe and Cr-Fe-Ni alloys)

IT 13494-80-9, Tellurium 14932-42-4, Xenon, isotope of mass 133
(**diffusion** of fission product, in Cr-Fe and Cr-Fe-Ni alloys)

IT 7439-98-7, Molybdenum
(**diffusion** of, in Cr-Fe and Cr-Fe-N alloys)

IT 7440-39-3, Barium
(**diffusion** of, in Cr-Fe and Cr-Fe-Ni alloys)

IT 7440-39-3, Barium
(**diffusion** of, in coated and uncoated ceramic nuclear-fuel particles)

IT 11122-73-9, Chromium alloys, iron- 12649-48-8, Chromium alloys, Fe-Ni-
(fission product **diffusion** in)

IT 7440-45-1, Cerium
(fission product, **diffusion** in Cr-Fe and Cr-FeNi alloys)

IT 7440-67-7, Zirconium
(fission-product, **diffusion** in Cr-Fe and Cr-Fe-Ni)

IT 7440-03-1, Niobium
(fission-product, **diffusion** in Cr-Fe and Cr-Fe-Ni alloys)

IT 7553-56-2, Iodine
(isotopes of, **diffusion** in Cr-Fe and Cr-Fe-Ni alloys)

L8 ANSWER 25 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1959:71956 CAPLUS
DOCUMENT NUMBER: 53:71956
ORIGINAL REFERENCE NO.: 53:13006a-e

TITLE: The theory of alloying of creep-resistant alloys
AUTHOR(S): Gomozov, L. I.
SOURCE: Trudy Inst. Met. im. A. A. Baikova (1958), (No. 3), 136-51
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable

AB A theory of plastic deformation and **diffusion**, based on the electron structure of metals, was described. During **diffusion** or plastic deformation, the electron **gases** of the atoms involved in the process were partly overlapped, causing the increase in the d. of the electron. According to Pauli's principle, part of the electrons should increase in kinetic energy, being forced to populate the higher energetic levels. The increase of the energy of the outer electrons was assumed to be approx. constant for the given metal. The term "rigid ion" was introduced for defining those ions which were characterized by high resistance against deformation and **diffusion.** The increase in ion rigidity was favored by a high ionization potential of outer electrons, high d. of electrons in the outer shells, and high charge of ion. The rigid ions in alloys or strain-hardened metal provided very high local resistance against shear. The effect might be responsible for the formation of pos. and neg. dislocations. At the higher temperature the interat. repulsive forces sharply diminished, owing to the increase in the interat. distances. Also, the potential barrier for gliding process of ions decreased. The increased moveability of ions at higher temperature eased the overflowing of ions without overlapping their electron shells, and quickly restored the equilibrium interat. distances. The improvement of creep resistance could be achieved by introduction of elements able to form rigid ions: Mo, W, **Re**, B, Cr, Be, **Nb**, **Zr**, Ta, V, Ni, Ti, Fe, Mn, Si, Al, and Cu. For the matrix, built of potentially rigid ions, the alloying elements should remove the outer electrons from the matrix ions and change them into the rigid ions. Assurance of compact arrangement of ions, and coherence between matrix and strengthening phases, also increased the creep resistance.

IT Electron **gas**
(creep-resistant **alloy** formation in relation to)

IT Alloys
Copper alloys
(creep-resistant, formation of)

IT **Diffusion**
(in alloys, creep-resistance and)

IT Boron alloys
(creep-resistant)

IT Vanadium alloys
(creep-resistant, formation of)

IT 7440-33-7, Tungsten
(alloys, creep-resistant)

IT 7429-90-5, Aluminum 7439-89-6, Iron 7439-96-5, Manganese 7439-98-7, Molybdenum 7440-02-0, Nickel 7440-03-1, Niobium 7440-15-5, Rhenium 7440-21-3, Silicon 7440-25-7, Tantalum 7440-32-6, Titanium 7440-41-7, Beryllium 7440-47-3, Chromium

(alloys, creep-resistant, formation of)

IT 183748-02-9, Electron

(configuration or density distribution of, in metals, creep-resistant **alloy** formation and)

IT 7440-67-7, Zirconium

(creep-resistant, formation of)

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     FILE 'CAPLUS' ENTERED AT 13:13:11 ON 01 APR 2004
L1          9741 S NB (P) (PD OR RU OR RE OR PT OR AU)
L2          4686 S L1 (P) (ZR OR HF)
L3          1680 S L2 AND ALLOY
L4            16 S L3 AND MEMBRANE
L5           134 S L3 AND (HYDROGEN OR H2)
L6            11 S L5 AND (DIFFUS### OR PERMEAT###)

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L6 ANSWER 1 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:76372 CAPLUS
DOCUMENT NUMBER: 140:113684
TITLE: Apparatus for production of **hydrogen** peroxide.
INVENTOR(S): Ito, Naotsugu; Minakami, Fujio; Tanba, Shuichi
PATENT ASSIGNEE(S): National Institute of Advanced Industrial Science and Technology, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004026550	A2	20040129	JP 2002-183846	20020625

PRIORITY APPLN. INFO.: JP 2002-183846 20020625

AB In title apparatus including a **hydrogen** dissociation/**permeation** membrane for dissociation of supplied **H2** mols. and **permeation** of active H atoms, and reacting the **permeated** active H atoms with supplied O2 for production and recovery of high-purity H2O2 at the O2 supply side, the **hydrogen** gas and O2 gas are reacted at temperature of ≥ 0°, e.g., 0-200°. A porous sintered article is covered at the O2 gas-contacting side of the **hydrogen** dissociation/**permeation** membrane. The **hydrogen** dissociation/**permeation** membrane is formed from **Pd**, Ta, **Nb**, V, Ni, **Zr**, or an **alloy** of **Pd**, Ta, **Nb**, V, **Zr** with ≥ 1 of Ag, **Au**, Rh, **Ru**, Sn, Se, Te, Si, Zn, In, Ir, Ni, Ti, Mo and Y, e.g., **Pd** (77%)-Ag(23%) **alloy**, etc. The sintered article is a stainless steel particulates sintered article.

IT Membranes, nonbiological
(**hydrogen** dissociation/**permeation**; apparatus for production of

hydrogen peroxide)

IT **Permeation**
(of **hydrogen** atoms; apparatus for production of **hydrogen** peroxide)

IT Dissociation
(of **hydrogen** mols.; apparatus for production of **hydrogen** peroxide)

IT Porous materials
(sintered; apparatus for production of **hydrogen** peroxide)

IT Niobium **alloy**, base
Palladium **alloy**, base
Tantalum **alloy**, base
Vanadium **alloy**, base
Zirconium **alloy**, base
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(membrane; apparatus for production of **hydrogen** peroxide)

IT 12385-13-6, Atomic **hydrogen**, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(active; apparatus for production of **hydrogen** peroxide)

IT 7722-84-1P, **Hydrogen** peroxide, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(apparatus for production of **hydrogen** peroxide)

IT 1333-74-0, **Hydrogen**, reactions 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(apparatus for production of **hydrogen** peroxide)

IT 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-25-7, Tantalum, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 12778-54-0
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(membrane; apparatus for production of **hydrogen** peroxide)

IT 12597-68-1, Stainless steel, uses
RL: DEV (Device component use); USES (Uses)
(sintered, porous article; apparatus for production of **hydrogen** peroxide)

L6 ANSWER 2 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:865660 CAPLUS
DOCUMENT NUMBER: 140:97616
TITLE: **Hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes
AUTHOR(S): Yamaura, Shin-ichi; Shimpo, Yoichiro; Okouchi, Hitoshi; Nishida, Motonori; Kajita, Osamu; Kimura, Hisamichi; Inoue, Akihisa
CORPORATE SOURCE: Institute for Materials Research, Tohoku University, Sendai, 980-8577, Japan
SOURCE: Materials Transactions (2003), 44(9), 1885-1890
CODEN: MTARCE; ISSN: 1345-9678
PUBLISHER: Japan Institute of Metals

DOCUMENT TYPE: Journal
LANGUAGE: English

AB We prepared the melt-spun (Ni0.6Nb0.4)100-xZrx (x = 0 to 40 atomic%) and other amorphous **alloy** membranes and examined the **permeation** of **hydrogen** through those **alloy** membranes. The interat. spacing in the Ni-**Nb-Zr** amorphous structure increased with increasing **Zr** content. The crystallization temperature of the Ni-**Nb-Zr** amorphous alloys decreased with increasing **Zr** content. The **hydrogen** flow increased with an increase of the temperature or the difference in the square-roots of **hydrogen** pressures across the membrane, $\Delta\sqrt{p}$. At relatively higher temperature up to 673 K or at relatively higher **hydrogen** pressure difference, $\Delta\sqrt{p} \leq 550$ Pa1/2, the **hydrogen** flow was more strictly proportional to $\Delta\sqrt{p}$. This indicates that the **diffusion** of **hydrogen** through the membrane is a rate-controlling factor for **hydrogen permeation.** The permeability of the Ni-**Nb-Zr** amorphous alloys was strongly dependent on **alloy** compns. and increased with increasing **Zr** content. However, it was difficult to investigate the **hydrogen** permeability of the (Ni0.6Nb0.4)60Zr40 amorphous **alloy** in this work due to the embrittlement during the measurement. The maximum **hydrogen** permeability was 1.3 + 10-8 (mol·m-1·s-1·Pa-1/2) at 673 K for the (Ni0.6Nb0.4)70Zr30 amorphous **alloy.** It is noticed that the **hydrogen** permeability of the (Ni0.6Nb0.4)70Zr30 amorphous **alloy** is higher than that of pure **Pd** metal. These **permeation** characteristics indicate the possibility of future practical use of the melt-spun amorphous alloys as a **hydrogen** permeable membrane.

IT Membranes, nonbiological
Permeability
(**hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes)

IT Metallic glasses
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes)

IT Rapid solidification
(melt spinning; **hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes)

IT Crystallization
(of amorphous **alloy** membranes; **hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes)

IT **Diffusion**
(rate-controlling process; **hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes)

IT 58959-49-2, Nickel 60, niobium 40 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(**hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes)

IT 1333-74-0, **Hydrogen**, processes 614756-57-9, Nickel 45, niobium 45, zirconium 10 (atomic) 614756-62-6, Nickel 42, niobium 28, zirconium 30 (atomic) 644961-25-1, Nickel 48, niobium 32, zirconium 20 (atomic) 644961-26-2, Nickel 36, niobium 24, zirconium 40 (atomic) 644961-27-3, Nickel 65, niobium 25, zirconium 10 (atomic) 644961-28-4, Nickel 44, niobium 43, palladium 3, zirconium 10 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**hydrogen permeation** characteristics of melt-spun Ni-Nb-Zr amorphous **alloy** membranes)

REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 3 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:761968 CAPLUS
DOCUMENT NUMBER: 139:278577
TITLE: Method for protection of **hydrogen**-permeable membrane apparatus
INVENTOR(S): Hara, Shigeki; Ito, Tadaji
PATENT ASSIGNEE(S): National Institute of Advanced Industrial Science and Technology, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003275553	A2	20030930	JP 2002-78085	20020320

PRIORITY APPLN. INFO.: JP 2002-78085 20020320

AB In title apparatus using metal or **alloy** capable of **permeating** H as H-permeable membrane, a gas discharge device is connected with a space linked with a H-permeable membrane, immediately after completing using the H-permeable membrane, the H-permeable membrane linked space is closed by valve(s) or other means, and the residue gas is removed by the gas discharge device at a temperature of ≥ Tc for protection; where Tc is the limiting temperature (i.e., lower limiting temperature) of using the H-permeable membrane. The H-permeable membrane is selected from ≥ 1 of the following metals or their alloys: **Pd**, V, Ti, **Zr**, Ni, **Pt**, **Ru**, **Nb**, Ta, Mg, Ca, and La. Fuel cell system using the apparatus is described.

IT Gases

(discharge of, device for; protection of **hydrogen**-permeable membrane apparatus)

IT Membranes, nonbiological
(**hydrogen**-permeable; protection of **hydrogen** -permeable membrane apparatus)

IT Valves
(protection of **hydrogen**-permeable membrane apparatus)

IT Calcium **alloy**, base
Lanthanum **alloy**, base
Magnesium **alloy**, base
Nickel **alloy**, base
Niobium **alloy**, base
Palladium **alloy**, base
Platinum **alloy**, base
Ruthenium **alloy**, base
Tantalum **alloy**, base
Titanium **alloy**, base
Vanadium **alloy**, base
Zirconium **alloy**, base
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(membrane, **hydrogen**-permeable; protection of **hydrogen** -permeable membrane apparatus)

IT 7439-91-0, Lanthanum, properties 7439-95-4, Magnesium, properties
7440-02-0, Nickel, properties 7440-03-1, Niobium, properties
7440-05-3, Palladium, properties 7440-06-4, Platinum, properties
7440-18-8, Ruthenium, properties 7440-25-7, Tantalum, properties
7440-32-6, Titanium, properties 7440-62-2, Vanadium, properties
7440-67-7, Zirconium, properties 7440-70-2, Calcium, properties
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(membrane, **hydrogen**-permeable; protection of **hydrogen** -permeable membrane apparatus)

IT 1333-74-0, **Hydrogen**, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(protection of **hydrogen**-permeable membrane apparatus)

L6 ANSWER 4 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:158936 CAPLUS
DOCUMENT NUMBER: 138:387472
TITLE: Application of rare metal-noble metal membranes to the purification of **hydrogen**
AUTHOR(S): Chen, Shaohua; Xing, Pifeng; Chen, Wenmei
CORPORATE SOURCE: School of Chemical Engineering, Sichuan University, Chengdu, 610065, Peop. Rep. China
SOURCE: Xiyou Jinshu (2003), 27(1), 8-17
CODEN: XIJID9; ISSN: 0258-7076
PUBLISHER: Xiyou Jinshu Bianjibu
DOCUMENT TYPE: Journal; General Review
LANGUAGE: Chinese

AB A review of the advantages and disadvantages of methods to purify

hydrogen isotopes to obtain ultra-high purity (99.9999%) H gas. The development and application of solid state **diffusion** membranes based on rare metal-noble metal alloys, e.g. **Pd**-Ag alloys, are discussed in detail. The merits and demerits of currently used **Pd**-Ag **alloy** membranes are considered. To prepare highly selective H-permeable membranes, the surface of the refractory metal used, e.g. **Zr**, **Nb**, Ta and V is modified. The requirements for a membrane are i.a. highly selective H-permeability, noble metal-**Pd** catalytic activity for H, and oxidation resistance. The highly selective H-permeable membranes prepared are able to produce ultra-high purity H gas.

IT Membranes, nonbiological
(review of application of rare metal-noble metal membranes in purification of **hydrogen**)

IT 1333-74-0P, **Hydrogen**, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(review of application of rare metal-noble metal membranes in purification of **hydrogen**)

IT 7440-05-3, Palladium, uses 7440-22-4, Silver, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(review of application of rare metal-noble metal membranes in purification of **hydrogen**)

L6 ANSWER 5 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:	2001:147074 CAPLUS
DOCUMENT NUMBER:	134:319358
TITLE:	Thermoelectric power of hydrogenated palladium and some of its dilute alloys, between 80 and 300 K
AUTHOR(S):	Szafranski, A. W.
CORPORATE SOURCE:	Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, 01-224, Pol.
SOURCE:	Journal of Alloys and Compounds (2001), 316(1-2), 82-89 CODEN: JALCEU; ISSN: 0925-8388
PUBLISHER:	Elsevier Science S.A.
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB Thermoelec. power and elec. resistance of **Pd** and PdMe (Me=Ti, **Nb**, **Zr**, Ce, Be and Ge) saturated with **hydrogen** at high pressure have been simultaneously measured between 80 and 300 K. Several exptl. runs have been carried out on samples of successively decreasing **hydrogen** content. The results have been analyzed in terms of the Nordheim-Gorter rule. The phonon and disorder **diffusion** contribution to the thermoelec. powers could be estimated

IT Disorder
Electric resistance
Hydrogenation
Phonon
Thermoelectricity
(thermoelec. power of hydrogenated palladium and some of its dilute

alloys)

IT 13940-18-6D, Palladium hydride PdH, **hydrogen**-deficient 335353-55-4D, Germanium palladium hydride (Ge0.05Pd0.95H), **hydrogen**-deficient 335353-56-5D, Palladium zirconium hydride (Pd0.96Zr0.04H), **hydrogen**-deficient 335353-57-6D, Cerium palladium hydride (Ce0.03Pd0.97H), **hydrogen**-deficient 335353-58-7D, Beryllium palladium hydride (Be0.05Pd0.95H), **hydrogen**-deficient 335353-59-8D, Niobium palladium hydride (Nb0.04Pd0.96H), **hydrogen**-deficient 335353-60-1D, Palladium titanium hydride (Pd0.96Ti0.04H), **hydrogen**-deficient

RL: PRP (Properties)

(thermoelec. power of hydrogenated palladium and some of its dilute alloys)

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 6 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:247251 CAPLUS
DOCUMENT NUMBER: 128:245579
TITLE: Heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom.
INVENTOR(S): Chen, Enjian; Lin, Bochuan; Guo, Zhen
PATENT ASSIGNEE(S): Guangzhou Inst. of Energy Sources, Chinese Academy of Sciences, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 11 pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1144324	A	19970305	CN 1994-116382	19940925
CN 1060859	B	20010117		

PRIORITY APPLN. INFO.: CN 1994-116382 19940925

AB The title heat pipe includes steel or stainless steel as shell material, and a H-containing organic or inorg. working medium, especially water as working medium in steel pipe. The heat pipe is characterized by having a H-permeable activated metal layer (HPAML) at least partially on the inner wall of its condensation end, and a H-desorption promoting metal layer (HDPML) on an outer wall position corresponding to that of HPAML on the inner wall; or a H-permeable element (with hollow structure) is welded on the condensation end of the heat pipe, and the above stated HPAML and HDPML are formed on the inner and outer surfaces of the H-permeable element resp. The HPAML is a plated- or sputtered layer selected from the following metals: V, **Nb**, Ta, Ti, **Zr**, **Hf**, **Pd**, La, Ce, **Pd**-V **alloy**, **Pd**-Ag, **Pd**-Ni, Fe-Ti and La-Ni **alloy**; the HDPML is a plated- or sputtered layer selected

from the following metals: Ni, **Pd**, Ni **alloy** (e.g., Ni-P **alloy**) and **Pd alloy** (e.g., **Pd** -P **alloy**). When operating the heat pipe, working medium-generated H is **permeated** through the HPAML- and HDPML-containing composite wall, and discharged from the heat pipe.

IT Metals, uses
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coatings; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT Heat pipes
Heat transfer
(heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT Coating materials
(metals; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT Desorption
Permeation
(of **hydrogen**, metal coating layers for; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT Waters
(working fluid; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT Fluids
(working, water for; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT Nickel **alloy**
Palladium **alloy**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coatings; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT 7439-91-0, Lanthanum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-45-1, Cerium, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 11123-79-8 11135-48-1 11146-55-7 11148-11-1 12703-49-0, Palladium base, phosphorus 12726-60-2 12788-42-0 54741-72-9 66758-09-6 75882-74-5
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(coatings; heat pipe with **hydrogen**-permeable and

desorption-promoting coating layers for removal of working
medium-generated **hydrogen** therefrom)

IT 12597-68-1, Stainless steel, uses 12597-69-2, Steel, uses
RL: DEV (Device component use); NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(pipe; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT 1333-74-0, **Hydrogen**, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); REM (Removal or disposal); FORM (Formation, nonpreparative); PROC (Process)
(removal of, permeable layer for; heat pipe with **hydrogen** -permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

IT 7732-18-5, Water, uses
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(working fluid; heat pipe with **hydrogen**-permeable and desorption-promoting coating layers for removal of working medium-generated **hydrogen** therefrom)

L6 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1985:618170 CAPLUS
DOCUMENT NUMBER: 103:218170
TITLE: Coated **diffusion** membrane and its use
INVENTOR(S): Harris, Jesse R.
PATENT ASSIGNEE(S): Phillips Petroleum Co. , USA
SOURCE: U.S., 4 pp. Cont. of U.S. Ser. No. 185,712, abandoned. CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4536196	A	19850820	US 1982-358570	19820316
PRIORITY APPLN. INFO.:			US 1980-185712	19800910

AB In the dehydrogenation of a hydrocarbon at 800-1300°F, hydrogenation takes place in a reaction zone in the presence of a membrane selectively permeable to H, which continuously removes H from the reaction zone by **diffusion.** The membrane is composed of a **Pd** or a **Pd alloy** and ≤1 metal of Group (IVB), Group (VB), and Group (VIB) metals, where the surface of the **Pd** or **Pd alloy** is coated with the 2nd metal. Suitable 2nd metals include **Zr**, Hg, Ti, V, **Nb**, and Ta, and Ag. Thus, a membrane, prepared by plating Ti on a 75:25 (weight%) **Pd**-Ag **alloy**, was used to sep. H from a H-C2H4 [74-85-1] mixture

IT Petroleum refining

(dehydrogenation, **hydrogen** separation in, permeable membrane for)
IT 7440-05-3, uses and miscellaneous 11122-11-5
RL: DEV (Device component use); USES (Uses)
(membranes containing, for separation of **hydrogen** from unsatd. hydrocarbons, in petroleum dehydrogenation)
IT 7440-03-1, uses and miscellaneous 7440-25-7, uses and miscellaneous
7440-32-6, uses and miscellaneous 7440-58-6, uses and miscellaneous
7440-62-2, uses and miscellaneous 7440-67-7, uses and miscellaneous
RL: USES (Uses)
(palladium **alloy**-based membranes containing, for separation of **hydrogen** from unsatd. hydrocarbons, in petroleum dehydrogenation)
IT 74-85-1P, preparation
RL: PREP (Preparation)
(preparation of, by dehydrogenation of ethane, separation of **hydrogen** in, permeable membrane for)
IT 1333-74-0P, preparation
RL: PREP (Preparation)
(separation of, from unsatd. hydrocarbons, permeable membrane for)

L6 ANSWER 8 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1981:124031 CAPLUS
DOCUMENT NUMBER: 94:124031
TITLE: Apparatus and method for separating **hydrogen** from fluids
INVENTOR(S): Hill, Eugene Farrell
PATENT ASSIGNEE(S): USA
SOURCE: Eur. Pat. Appl., 29 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 15428	A1	19800917	EP 1980-100783	19800215
R: DE, FR, GB				
JP 55130801	A2	19801011	JP 1980-16110	19800214

PRIORITY APPLN. INFO.: US 1979-12471 19790215

AB The H in a fluid is separated by **permeating** through a membrane comprised of a Ti-**Zr alloy** that is stabilized in the body centered cubic form with a 3rd metal, e.g., V, Mo, Cr, **Nb**, and Fe, and coated with a H-permeable element that is resistant to corrosion by the fluid containing the H. Coatings of Ni, Co, Fe, **Pd**, **Pt**, V, **Nb**, and Ta can be used. The H is allowed to **permeate** through the coated **alloy** and is stored in the **alloy** or removed by providing a H pressure differential across the entry and exit surfaces. Thus, when the **alloy** VC120, comprising V 13, Cr 11, Al 3, and Ti balance, coated with Ni was in contact with Na containing a known

amount of **H2** the **H2** concentration in the Na was decreased to
0.15 ppm. The Na is pure enough to be used in a nuclear reactor.

IT 7440-02-0, uses and miscellaneous
RL: USES (Uses)
(coating, on aluminum-chromium-vanadium-vanadium **alloy**, for **hydrogen permeation**)

IT 12604-38-5
RL: USES (Uses)
(membrane, nickel coating on, for **hydrogen** separation from sodium)

IT 7440-23-5P, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(purification of, by **hydrogen** removal, nickel-coated aluminum-chromium-titanium-vanadium **alloy** membrane for)

IT 1333-74-0P, preparation
RL: PREP (Preparation)
(separation of, from sodium, nickel-coated aluminum-chromium-titanium-vanadium **alloy** membrane for)

L6 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1974:72526 CAPLUS
DOCUMENT NUMBER: 80:72526
TITLE: **Hydrogen diffusion** apparatus
INVENTOR(S): Eguchi, Takashi; Gotoh, Yoshiaki
PATENT ASSIGNEE(S): Japan Pure Hydrogen, Inc.
SOURCE: Jpn. Tokkyo Koho, 5 pp.
CODEN: JAXXAD
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 48030233	B4	19730918	JP 1968-49679	19680716

PRIORITY APPLN. INFO.: JP 1968-49679 19680716

AB An apparatus is described for preparing high-purity H by **diffusion** through a **Pd-alloy** membrane. The H prepared by electrolysis of H2O is led into the apparatus at 500°. The H is initially passed through a metal sponge (e.g., Ti, **Zr**, V, **Hf**, Th, Ta, Ce, La, **Nb**, etc.) sandwich between two porous sintered metal plates and then comes into contact with the **Pd alloy** in the form of thin-walled tubes open at one end. The metal sponge removes any O in the H and prevents any adverse change of the **Pd alloy** because it releases or absorbs H in proportion to the increase or decrease, resp., of the temperature With such an apparatus H with a dew point of -75° containing 0.1 ppm O was obtained.

IT 1333-74-0P, preparation
RL: PREP (Preparation)
(high-purity, apparatus for)

L6 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1971:43925 CAPLUS
DOCUMENT NUMBER: 74:43925
TITLE: Compacted metallic body for the separation and purification of **hydrogen** and its isotopes
PATENT ASSIGNEE(S): Varta A.-G.
SOURCE: Brit., 5 pp.
CODEN: BRXXAA
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
GB 1168457		19691029		
DE 1592274			DE	

PRIORITY APPLN. INFO.: DE 19651216

AB A H-absorbing pore-free body comprises a pulverulent binder (a ductile metal, e.g. Ni, Cu, Pb or Ag, or a synthetic resin permeable to H) and a pulverulent H-absorbing metal (e.g. Raney Ni, Raney Co, Ti, **Zr**, **Hf**, V, **Nb**, Ta, Cr, Mo, or W). The body may also contain minor proportions of a noble metal, e.g. **Pt** or **Pd**, and a catalytically inactive metal, e.g. Zn, Mg, Ba, or Al. The body is in the form of a tube, or a foil supported on a metal gauze or on a porous sintered plate. The H-absorbing metal is prepared by leaching out, with evolution of H, a catalytically inactive component from its **alloy** with the metal, and rendering the metal nonpyrophoric. Thus, 200 g Raney Ni **alloy** (Ni:Al = 1:1) of particle size <2 μ was introduced to 2 l. 6N KOH. H was evolved and 50 ml of a 1% $CuCl_2$ solution was added. The powder was washed with KOH, H_2O, then treated with a 12% KIO_3 solution, washed with H_2O again, and dried. This activated Raney Ni powder was mixed with an equal quantity of Ag powder <40 μ, and the mixture pressed at 450° and 4 tons/cm2 to pore-free foils. At a differential pressure of 1.2 atm and 100°, 64 ml pure **H_2**/hr cm2 from a gaseous mixture of 75 volume % H and 25% CO_2, **diffused** through a foil of thickness 0.5 mm.

IT Nickel alloys, containing
(compacted absorbents, for **hydrogen** purification)

IT Uranium alloys, containing
(lead-nickel-, compacted absorbents, for **hydrogen** purification)

IT Platinum alloys, containing
Silver alloys, containing
Vanadium alloys, containing
(nickel-, compacted absorbents, for **hydrogen** purification)

IT Lead alloys, base
(nickel-uranium-, compacted absorbents, for **hydrogen** purification)

IT Silver alloys, base
(nickel-vanadium-, compacted absorbents, for **hydrogen** purification)
IT Nickel alloys, base
(platinum-, compacted absorbents, for **hydrogen** purification)
IT 7440-48-4, uses and miscellaneous 7440-50-8, uses and miscellaneous
RL: USES (Uses)
(compacted absorbents, for **hydrogen** purification)
IT 1333-74-0P, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(purification of, compacted metallic absorbents for)

L6 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1967:424850 CAPLUS
DOCUMENT NUMBER: 67:24850
TITLE: Dry corrosion of cobalt-chromium alloys at high temperature. Influence of ternary additions
AUTHOR(S): Davin, A.; Coutsouradis, D.; Habraken, Louis
CORPORATE SOURCE: Centre Natl. Rech. Met., Leige, Belg.
SOURCE: Cobalt (English Edition) (1967), 35(69-77), 69-77
CODEN: COBAAP; ISSN: 0010-0048
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The corrosion resistance was investigated of Co-10 to 35% Cr alloys, and of their ternaries with either Mo, W, **Zr**, Fe, Ni, **Nb**, Ta, Ce, B, Y, or **Re**. The binary alloys were tested in an H2S containing atmospheric as well as still air, and in synthetic atmospheric simulating combustion gases, as such, and with S and NaCl. Corrosion was generally controlled by the outward **diffusion** of cations. The sulfidation resistance of Co-Cr alloys was not appreciably modified by ternary addns., except that the Co-10 Cr-1Al **alloy** had improved resistance at 800°. On oxidation of Cr-rich alloys at high temperature, the protective Cr2O3 spalled off during the test. This was not observed in Ta-, W-, Al-, **Zr**-, Ti-, Ce-, and **Nb**-containing Co-Cr alloys. Ta improved considerably the oxidation resistance of low Cr alloys. In combustion gases the corrosion resistance of the alloys was reduced by the presence of NaCl. High Cr contents are necessary, and Al, Ta, and Y are beneficial.

IT Chromium alloys, containing
(aluminum-cobalt-, cobalt-tantalum-, and yttrium-containing cobalt-, corrosion resistance of, in **hydrogen** sulfide atmospheric, sodium chloride effect on)
IT Cobalt alloys, base
(chromium-, corrosion resistance of yttrium-containing, in **hydrogen** sulfide atmospheric, sodium chloride effect on)
IT Cobalt alloys, base
(chromium-aluminum-, corrosion resistance of, in **hydrogen** sulfide atmospheric, sodium chloride effect on)
IT Aluminum alloys, containing
Tantalum alloys, containing
(chromium-cobalt-, corrosion resistance of, in **hydrogen**

sulfide atmospheric, sodium chloride effect on)
IT Cobalt alloys, base
(chromium-tantalum-, corrosion resistance of, in **hydrogen** sulfide atmospheric, sodium chloride effect on)
IT 7783-06-4, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(corrosion by, of chromium-cobalt alloys, effect of alloying elements and sodium chloride on)
IT 7647-14-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(corrosion of chromium-cobalt alloys by **hydrogen** sulfide atmospheric containing)
IT 7440-65-5, properties
RL: PRP (Properties)
(corrosion resistance of chromium-cobalt alloys containing, in **hydrogen** sulfide atmospheric, sodium chloride effect on)

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     FILE 'CAPLUS' ENTERED AT 13:13:11 ON 01 APR 2004
L1          9741 S NB (P) (PD OR RU OR RE OR PT OR AU)
L2          4686 S L1 (P) (ZR OR HF)
L3          1680 S L2 AND ALLOY
L4            16 S L3 AND MEMBRANE
L5           134 S L3 AND (HYDROGEN OR H2)
L6            11 S L5 AND (DIFFUS### OR PERMEAT###)
L7           111 S L3 AND (DIFFUS### OR PERMEAT### OR PURIF#### OR PURIFICATION)
L8            25 S L7 AND GAS##

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L8 ANSWER 1 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:76372 CAPLUS
DOCUMENT NUMBER: 140:113684
TITLE: Apparatus for production of hydrogen peroxide.
INVENTOR(S): Ito, Naotsugu; Minakami, Fujio; Tanba, Shuichi
PATENT ASSIGNEE(S): National Institute of Advanced Industrial Science and Technology, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004026550	A2	20040129	JP 2002-183846	20020625

PRIORITY APPLN. INFO.: JP 2002-183846 20020625

AB In title apparatus including a hydrogen dissociation/**permeation** membrane for dissociation of supplied H_2 mols. and **permeation** of active H atoms, and reacting the **permeated** active H atoms with supplied O_2 for production and recovery of high-purity H_2O_2 at the O_2 supply side, the hydrogen **gas** and O_2 **gas** are reacted at temperature of ≥ 0°, e.g., 0-200°. A porous sintered article is covered at the O_2 **gas**-contacting side of the hydrogen dissociation/**permeation** membrane. The hydrogen dissociation/**permeation** membrane is formed from **Pd**, Ta, **Nb**, V, Ni, **Zr**, or an **alloy** of **Pd**, Ta, **Nb**, V, **Zr** with ≥ 1 of Ag, **Au**, Rh, **Ru**, Sn, Se, Te, Si, Zn, In, Ir, Ni, Ti, Mo and Y, e.g., **Pd** (77%)-Ag(23%) **alloy**, etc. The sintered article is a stainless steel particulates sintered article.

IT Membranes, nonbiological

(hydrogen dissociation/**permeation**; apparatus for production of hydrogen peroxide)
IT **Permeation**
(of hydrogen atoms; apparatus for production of hydrogen peroxide)
IT Dissociation
(of hydrogen mols.; apparatus for production of hydrogen peroxide)
IT Porous materials
(sintered; apparatus for production of hydrogen peroxide)
IT Niobium **alloy**, base
Palladium **alloy**, base
Tantalum **alloy**, base
Vanadium **alloy**, base
Zirconium **alloy**, base
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(membrane; apparatus for production of hydrogen peroxide)
IT 12385-13-6, Atomic hydrogen, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(active; apparatus for production of hydrogen peroxide)
IT 7722-84-1P, Hydrogen peroxide, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(apparatus for production of hydrogen peroxide)
IT 1333-74-0, Hydrogen, reactions 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(apparatus for production of hydrogen peroxide)
IT 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-25-7, Tantalum, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 12778-54-0
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(membrane; apparatus for production of hydrogen peroxide)
IT 12597-68-1, Stainless steel, uses
RL: DEV (Device component use); USES (Uses)
(sintered, porous article; apparatus for production of hydrogen peroxide)

L8 ANSWER 2 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:761968 CAPLUS
DOCUMENT NUMBER: 139:278577
TITLE: Method for protection of hydrogen-permeable membrane apparatus
INVENTOR(S): Hara, Shigeki; Ito, Tadaji
PATENT ASSIGNEE(S): National Institute of Advanced Industrial Science and Technology, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

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     JP 2003275553     A2  20030930       JP 2002-78085    20020320
PRIORITY APPLN. INFO.:                   JP 2002-78085    20020320
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AB In title apparatus using metal or **alloy** capable of **permeating** H as H-permeable membrane, a **gas** discharge device is connected with a space linked with a H-permeable membrane, immediately after completing using the H-permeable membrane, the H-permeable membrane linked space is closed by valve(s) or other means, and the residue **gas** is removed by the **gas** discharge device at a temperature of ≥ Tc for protection; where Tc is the limiting temperature (i.e., lower limiting temperature) of using the H-permeable membrane. The H-permeable membrane is selected from ≥ 1 of the following metals or their alloys: **Pd**, V, Ti, **Zr**, Ni, **Pt**, **Ru**, **Nb**, Ta, Mg, Ca, and La. Fuel cell system using the apparatus is described.

IT **Gases**
(discharge of, device for; protection of hydrogen-permeable membrane apparatus)

IT Membranes, nonbiological
(hydrogen-permeable; protection of hydrogen-permeable membrane apparatus)

IT Valves
(protection of hydrogen-permeable membrane apparatus)

IT Calcium **alloy**, base
Lanthanum **alloy**, base
Magnesium **alloy**, base
Nickel **alloy**, base
Niobium **alloy**, base
Palladium **alloy**, base
Platinum **alloy**, base
Ruthenium **alloy**, base
Tantalum **alloy**, base
Titanium **alloy**, base
Vanadium **alloy**, base
Zirconium **alloy**, base
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(membrane, hydrogen-permeable; protection of hydrogen-permeable membrane apparatus)

IT 7439-91-0, Lanthanum, properties 7439-95-4, Magnesium, properties
7440-02-0, Nickel, properties 7440-03-1, Niobium, properties
7440-05-3, Palladium, properties 7440-06-4, Platinum, properties
7440-18-8, Ruthenium, properties 7440-25-7, Tantalum, properties
7440-32-6, Titanium, properties 7440-62-2, Vanadium, properties
7440-67-7, Zirconium, properties 7440-70-2, Calcium, properties
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(membrane, hydrogen-permeable; protection of hydrogen-permeable membrane apparatus)

IT 1333-74-0, Hydrogen, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(protection of hydrogen-permeable membrane apparatus)

L8 ANSWER 3 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:158936 CAPLUS
DOCUMENT NUMBER: 138:387472
TITLE: Application of rare metal-noble metal membranes to the **purification** of hydrogen
AUTHOR(S): Chen, Shaohua; Xing, Pifeng; Chen, Wenmei
CORPORATE SOURCE: School of Chemical Engineering, Sichuan University, Chengdu, 610065, Peop. Rep. China
SOURCE: Xiyou Jinshu (2003), 27(1), 8-17
CODEN: XIJID9; ISSN: 0258-7076
PUBLISHER: Xiyou Jinshu Bianjibu
DOCUMENT TYPE: Journal; General Review
LANGUAGE: Chinese

AB A review of the advantages and disadvantages of methods to **purify** hydrogen isotopes to obtain ultra-high purity (99.9999%) H **gas.** The development and application of solid state **diffusion** membranes based on rare metal-noble metal alloys, e.g. **Pd**-Ag alloys, are discussed in detail. The merits and demerits of currently used **Pd**-Ag **alloy** membranes are considered. To prepare highly selective H-permeable membranes, the surface of the refractory metal used, e.g. **Zr**, **Nb**, Ta and V is modified. The requirements for a membrane are i.a. highly selective H-permeability, noble metal-**Pd** catalytic activity for H, and oxidation resistance. The highly selective H-permeable membranes prepared are able to produce ultra-high purity H **gas.**

IT Membranes, nonbiological
(review of application of rare metal-noble metal membranes in **purification** of hydrogen)

IT 1333-74-0P, Hydrogen, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(review of application of rare metal-noble metal membranes in **purification** of hydrogen)

IT 7440-05-3, Palladium, uses 7440-22-4, Silver, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(review of application of rare metal-noble metal membranes in **purification** of hydrogen)

L8 ANSWER 4 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:946183 CAPLUS
DOCUMENT NUMBER: 138:26919
TITLE: Conductive catalyst particle and its manufacturing method, **gas-diffusing** catalyst electrode, and electrochemical device
INVENTOR(S): Katori, Kenji; Kanemitsu, Toshiaki; Shirai, Katsuya
PATENT ASSIGNEE(S): Sony Corporation, Japan
SOURCE: PCT Int. Appl., 86 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

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     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
     WO 2002098561      A1   20021212      WO 2002-JP5035   20020524
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
             GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
             LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL,
             PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA,
             UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,
             CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,
             BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
     JP 2003080085      A2   20030318      JP 2002-128199   20020430
     EP 1402951         A1   20040331      EP 2002-728135   20020524
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
PRIORITY APPLN. INFO.:                   JP 2001-166646   A  20010601
                                         JP 2001-198280   A  20010629
                                         JP 2002-128199   A  20020430
                                         WO 2002-JP5035   W  20020524
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AB A conductive catalyst particle composed of a conductive powder particle to which adhered is a catalyst material made of an **alloy** of a noble metal material and an additive material not thermally forming a solid solution in the noble metal material or an **alloy** of MI (≥1 element selected from noble metal elements) and MII (≥1 element selected from Fe, Co, Ni, Cr, Al, Cu, **Hf**, **Zr**, Ti, V, **Nb**, Ta, W, Ga, Sn, Ge, Si, **Re**, Os, Pb, Bi, Sb, Mo, Mn, O, N, C, Zn, In, and rare earth elements). The conductive catalyst particle is produced by simultaneously attaching the noble metal material and the additive material to the conductive power particle or the MI and the MII by phys. vapor deposition. The conductive catalyst particle does not undergo sintering and is applied to a **gas-diffusing** catalytic electrode and an elec. device using the electrode.

IT Catalysts
Fuel cell electrodes
(conductive catalyst particle for **gas-diffusing** catalyst electrode)

IT Sputtering
Vapor deposition process
(in production of conductive catalyst particle for **gas-diffusing** catalyst electrode)

IT 1314-35-8, Tungsten oxide wo3, uses 1314-62-1, Vanadium oxide v2o5, uses 7440-44-0, Carbon, uses 7631-86-9, Silica, uses 11123-71-0 12024-21-4, Gallium oxide ga2o3 37274-26-3 51399-12-3 53070-44-3 54727-57-0 67622-05-3 70222-42-3 100471-45-2 100661-88-9 101029-26-9 106857-21-0 114269-91-9 115159-15-4 116969-22-3 121229-13-8 125071-08-1 128297-30-3 130864-27-6 130864-55-0

137917-27-2 146080-59-3 146178-69-0 167952-75-2 168101-36-8
478180-79-9 478180-80-2 478180-81-3 478180-82-4 478180-83-5
478180-84-6 478180-85-7 478180-86-8 478180-87-9 478180-88-0
478180-89-1 478180-90-4 478180-91-5 478180-92-6 478180-93-7
478180-94-8 478180-95-9 478180-96-0 478180-97-1 478180-98-2
478180-99-3 478181-00-9 478181-01-0 478181-02-1 478181-03-2
478181-04-3 478181-05-4 478181-06-5 478181-07-6 478181-08-7
478181-09-8 478181-10-1 478181-11-2 478181-12-3 478181-13-4
478181-14-5, uses 478181-15-6, uses 478181-16-7, uses 478181-17-8, uses 478181-18-9, uses 478181-19-0 478181-20-3 478181-21-4
478181-22-5 478181-23-6 478181-24-7 478181-25-8 478181-28-1
478181-31-6 478181-34-9 478181-37-2, uses 478181-40-7, uses
478181-43-0, uses 478181-46-3, uses 478181-49-6, uses 478181-50-9, uses 478181-51-0 478181-52-1 478181-53-2 478181-54-3 478181-55-4
478181-56-5 478181-57-6 478181-58-7 478181-59-8 478181-60-1
478181-61-2 478181-62-3 478181-63-4 478181-64-5 478181-65-6
478181-66-7 478181-67-8 478181-68-9 478181-69-0 478181-70-3
478181-71-4 478181-72-5 478181-73-6 478181-74-7 478181-75-8
478181-76-9 478181-77-0 478181-78-1 478181-79-2 478181-80-5
478181-81-6 478181-82-7 478181-83-8 478181-84-9 478181-85-0

RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(conductive catalyst particle for **gas-diffusing** catalyst electrode)

REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 5 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:925278 CAPLUS
DOCUMENT NUMBER: 138:7319
TITLE: Brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of a hot **gas** path of a turbine
INVENTOR(S): Zhao, Ji-Cheng; Bewlay, Bernard Patrick; Jackson, Melvin Robert
PATENT ASSIGNEE(S): General Electric Company, USA
SOURCE: Eur. Pat. Appl., 14 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1262267	A1	20021204	EP 2002-253645	20020523
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 6565989	B2	20030520	US 2001-867487	20010530

PRIORITY APPLN. INFO.: US 2001-867487 A 20010530

AB The brazing method and filler metal compns. are suitable for joining

double-walled airfoil, **diffuser**, casing, seal ring structure, or the like that is intended for use in a new generation of turbine assembly in which temps. in excess of 1000° are encountered. An airfoil having a melting temperature of at least 1500°, preferably .apprx.1700°, comprises a first piece and a second piece joined by brazing. The first piece comprises one of a first niobium-based refractory metal intermetallic composite (**Nb**-RMIC) and a first molybdenum-based refractory metal intermetallic composite (Mo-RMIC), and the second piece comprises one of a second **Nb**-RMIC and a second Mo-RMIC. The Mo-RMICs are based on molybdenum silicides, such as MoSi2, Mo3Si, Mo5Si3, and Mo5SiB2 and comprise Mo, Si, and at least one of B or Cr, e.g., Si 2.5-13.5, B 3.5-26.5 atomic%, and Mo in the balance. The **Nb**-RMICs preferably have compns. in the range of Ti 20-30, Si 13-20, **Hf** 2-10, Cr 1-12, Al 1-3, Ge ≤4, B 5-7 atomic%, and **Nb** in the balance. The brazing filler metal comprises one of Ge and Si, and one of Cr, Ti, **Au**, Al, **Pd**, **Pt**, and Ni. For example, Ge-based brazing eutectic alloys are Ge 85 and Cr 15 atomic%, Ge 88 and Ti 12 atomic%, Ge 85 and Ti 15 atomic%, **Au** 72 and Ge 28 atomic%, Al 72 and Ge 28 atomic%, **Pd** 81 and Ge 19 atomic%, **Pd** 36 and Ge 64 atomic%, **Pt** 62 and Ge 38 atomic%, **Pt** 23 and Ge 77 atomic%, and Ni 34 and Ge 66 atomic%, and Si-based brazing eutectic alloys are Si 82 and Cr 18 atomic%, Si 13 and Ti 87 atomic%, atomic%, Si 83 and Ti 17 atomic%, Si 19 and **Au** 81 atomic%, Si 12 and Al 88 atomic%, Si 18 and **Pd** 82 atomic%, Si 52 and **Pd** 48 atomic%, Si 27 and **Pt** 73 atomic%, Si 67 and **Pt** 33 atomic%, Si 50 and Ni 50 atomic%. The first piece, second piece, and braze are heated to a first temperature for a first predetd. hold time, the first temperature at least .apprx.20° above the melting temperature of brazing filler metal. Next step, the first piece, second piece, and braze are further heated to a temperature of 1300-1450° for a second predetd. hold time, thereby joining first piece and second piece at interface and forming finally joined article.

IT Brazes
(Ge-based and Si-based eutectics; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT Metal matrix composites
(Nb-based and Mo-based refractory metal intermetallic composite; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT Refractory metals
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Nb-based and Mo-based refractory metal intermetallic composite; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT Turbines
(blades, double-walled airfoils, brazing of; brazing of niobium

silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT Turbines
(brazing of; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT Alloys, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(eutectic, of Ge and Si systems; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT Brazing
(vacuum; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT 476667-03-5 476667-04-6 476667-05-7 476667-06-8
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**alloy** for hot turbine parts; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT 7429-90-5, Aluminum, uses 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-42-8, Boron, uses 7440-47-3, Chromium, uses 7440-56-4, Germanium, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(alloying element in brazing filler metals; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT 86957-30-4 476666-77-0 476666-78-1 476666-80-5 476666-82-7 476666-84-9 476666-86-1 476666-88-3 476666-89-4 476666-90-7 476666-92-9 476666-93-0 476666-95-2 476666-96-3 476666-97-4 476666-98-5 476666-99-6 476667-00-2 476667-01-3 476667-02-4
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(brazing filler metal; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT 12033-37-3, Molybdenum silicide (Mo3Si) 12033-40-8, Molybdenum silicide (Mo5Si3) 12136-78-6, Molybdenum silicide (MoSi2) 52350-91-1, Molybdenum boride silicide (Mo5B2Si)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(matrix of Mo-based intermetallic composite; brazing of niobium

silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

IT 39336-13-5, Niobium silicide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(matrix of Nb-based intermetallic composite; brazing of niobium silicide and molybdenum silicide composite double-walled airfoils and other parts of hot **gas** path of turbine)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 6 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:658314 CAPLUS
DOCUMENT NUMBER: 137:189100
TITLE: High temperature aluminized MCrAIX coatings for superalloys used **gas** turbines
INVENTOR(S): Zheng, Xiaoci M.
PATENT ASSIGNEE(S): USA
SOURCE: PCT Int. Appl., 25 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002066706	A2	20020829	WO 2002-US4489	20020215
WO 2002066706	A3	20031016		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002155316	A1	20021024	US 2001-873964	20010604
US 6635362	B2	20031021		
EP 1370711	A2	20031217	EP 2002-742476	20020215

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

PRIORITY APPLN. INFO.:
US 2001-269685P P 20010216
US 2001-873964 A 20010604
WO 2002-US4489 W 20020215

AB Coating for high temperature **gas** turbine components that includes (a) a MCrAlX phase (where M is Ni, Co, and/or Fe; and X is Y, **Hf**,

Ta, Mo, W, **Re**, Rh, Cd, In, Ti, **Nb**, Si, **Zr**,
B, C, Ce, and/or **Pt**), and (b) an aluminum-rich phase,
significantly increasing oxidation and cracking resistance of the components,
thereby increasing their useful life and reducing operating costs. The
composition of the superalloy was Ni60.5/Co9.5/Cr14/Al3/X13, where X is Ta, W,
Mo, Ti, **Zr**, C, and/or B. The amount of the MCrAIX phase ranges
from 50-95 weight parts, and the amount of the aluminum-rich phase ranges from
5-50 weight parts. The aluminum-rich phase includes aluminum at a higher
concentration than aluminum concentration in the MCrAlX **alloy**, and an aluminum
diffusion-retarding composition, which may include cobalt, nickel,
yttrium, zirconium, niobium, molybdenum, rhodium, cadmium, indium, cerium,
iron, chromium, tantalum, silicon, boron, carbon, titanium, tungsten,
rhenium, platinum, and combinations thereof. For instance, said aluminum
diffusion-retarding composition comprises **Re** 10-90 weight% and
Ni 10-90 weight%. The MCrAIX phase comprises ≤10 weight% of Al, and the
aluminum-rich phase comprises ≥15 weight% of Al, e.g., Ni 30,
Re 20, and Al 50 weight%. The aluminum-rich phase may be derived
from a particulate aluminum composite that has a core comprising aluminum
and a shell comprising the aluminum **diffusion**-retarding composition

IT Composites
(composite coating, particulate aluminum composite; high temperature
aluminized MCrAIX coatings for superalloys used **gas** turbines)

IT Turbines
(high temperature aluminized coatings for; high temperature aluminized MCrAIX
coatings for superalloys used **gas** turbines)

IT Thermal fatigue
(high temperature aluminized coatings; high temperature aluminized MCrAIX coatings
for superalloys used **gas** turbines)

IT Fatigue, mechanical
(low-cycle fatigue; high temperature aluminized MCrAIX coatings for
superalloys used **gas** turbines)

IT Coating materials
(oxidation-resistant, aluminized; high temperature aluminized MCrAIX coatings
for superalloys used **gas** turbines)

IT Coating process
(plasma spraying, high velocity oxyfuel plasma; high temperature aluminized
MCrAIX coatings for superalloys used **gas** turbines)

IT 352006-87-2
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(MCrAIX coating **alloy**; high temperature aluminized MCrAIX coatings
for superalloys used **gas** turbines)

IT 451503-66-5
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(aluminum **diffusion**-retarding **alloy**; high temperature
aluminized MCrAIX coatings for superalloys used **gas** turbines)

IT 451503-67-6
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)

(aluminum-rich phase in high temperature MCrAIX coatings; high temperature aluminized MCrAIX coatings for superalloys used **gas** turbines)

IT 12003-81-5
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(intermetallic phase; high temperature aluminized MCrAIX coatings for superalloys used **gas** turbines)

IT 80377-27-1 451503-68-7
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(particulate aluminum composite; high temperature aluminized MCrAIX coatings for superalloys used **gas** turbines)

L8 ANSWER 7 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:251864 CAPLUS
DOCUMENT NUMBER: 136:282873
TITLE: Cobalt-**alloy** brazes for **diffusion** repair of superalloy articles with optional coating or long-term heat treatment
INVENTOR(S): Chesnes, Richard Patrick
PATENT ASSIGNEE(S): Rolls-Royce Corporation, USA
SOURCE: U.S., 11 pp., Cont.-in-part of U.S. 5,916,518. CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6365285	B1	20020402	US 1999-307616	19990507
US 5916518	A	19990629	US 1997-827723	19970408
WO 2000071764	A2	20001130	WO 2000-US12222	20000505
WO 2000071764	A3	20010412		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
AU 2000068892	A5	20001212	AU 2000-68892	20000505
EP 1207979	A2	20020529	EP 2000-957242	20000505

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003527480	T2	20030916	JP 2000-620140	20000505

PRIORITY APPLN. INFO.:
US 1997-827723 A2 19970408
US 1999-306968 A 19990507
US 1999-307616 A 19990507

WO 2000-US12222 W 20000505

AB The Co-**alloy** brazes for **diffusion** repair of superalloy articles contain: (a) Ni ≥0.001% but less than the Co content; (b) Ir and **Ru** at ≤12% each; (c) Si 4-6 and/or B 0.5-2.5%; and (d) Cr ≤40, Al ≤12, Ti ≤6, W ≤15, Mo ≤15, **Nb** ≤12, **Re** ≤15, **Hf** ≤6, Ta ≤15, **Pd** ≤40, **Pt** ≤40, Fe ≤3, Mn ≤1, C ≤2, **Zr** ≤2, and rare-earth metals ≤5%. The typical Co **alloy** contains Ni 29-32, Cr 13.75-15.75, Al 2.3-4.4, W 0.3-2.4, **Re** 0.001-1.5, Ta 7.8-9.8, **Hf** 0.001-1.5, **Pd** 2-4, **Pt** ≤40, C ≤0.8, B 1.3-3.4, Si 2.3-4.4, and rare-earth metals ≤5%. The preferred Co **alloy** contains Ni 10.5, Cr 22, Al 1.75, W 4, Ta 6.5, **Re** 0-15, **Pd** 0-40, **Pt** 0.001-40, and C 0-0.55%. The superalloy parts are repaired by **diffusion** brazing with: (a) heating the parts in brazing atmospheric under vacuum; (b) heating the **alloy** braze joint in stages for 15 min at 800° F, 15 min at 1800° F, and then for 15-45 min below the superalloy solidus temperature; and (c) cooling the brazed joint with the furnace to .apprx.1800° F. The Co-**alloy** brazed joint is optionally coated with environmentally protective layer of aluminide **alloy**, **Pt** aluminide, or **diffusion** braze **alloy.** The brazing process is suitable for repair of superalloy parts of **gas**-turbine engines, power generation turbines, petroleum refinery equipment, and heat exchangers.

IT Welding of metals
(**diffusion**, repair, of superalloys; cobalt-**alloy** braze for **diffusion** repair of superalloy **gas** -turbine parts)

IT Turbines
(repair of, braze for; cobalt-**alloy** braze for **diffusion** repair of superalloy **gas**-turbine parts)

IT Brazing
(repair, of superalloys; cobalt-**alloy** braze for **diffusion** repair of superalloy **gas**-turbine parts)

IT 309956-19-2 406481-16-1 406481-18-3
RL: TEM (Technical or engineered material use); USES (Uses)
(alloying of, for brazing; cobalt-**alloy** braze for **diffusion** repair of superalloy **gas**-turbine parts)

IT 214284-70-5 214284-71-6 214284-72-7 214284-73-8 214284-74-9 214284-75-0 214284-78-3
RL: TEM (Technical or engineered material use); USES (Uses)
(braze; cobalt-**alloy** braze for **diffusion** repair of superalloy **gas**-turbine parts)

IT 57621-59-7
RL: TEM (Technical or engineered material use); USES (Uses)
(coating with; cobalt-**alloy** braze for **diffusion** repair of superalloy **gas**-turbine parts with coating)

REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 8 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:771028 CAPLUS
DOCUMENT NUMBER: 135:307166
TITLE: **Diffusion**-barrier **alloy** interlayers suitable for Ni-superalloy turbine blades with ceramic coating
INVENTOR(S): Spitsberg, Irene T.; Darolia, Ramgopal; Jackson, Melvin R.; Zhao, Ji-Cheng; Schaeffer, Jon C.
PATENT ASSIGNEE(S): General Electric Company, USA
SOURCE: U.S., 12 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6306524	B1	20011023	US 1999-275096	19990324

PRIORITY APPLN. INFO.: US 1999-275096 19990324

AB The superalloy **gas**-turbine blades and similar articles are coated with: (a) **diffusion**-barrier interlayer based on heat-resistant **alloy** or intermetallic compound; (b) high-Al intermediate layer, especially as Ni-Cr-Al-Y, **Pt** aluminide, or Ni aluminide **alloy**; and (c) ceramic top coating having high Al content, especially as stabilized ZrO_2 for thermal barrier. The **diffusion** barrier layer is preferably based on **Ru**-containing Ni, Cr, and/or Co alloys having low solubility for Al from either the substrate or the protective coating. The barrier **alloy** is preferably Ni_2AlX type with X as Ta, **Hf**, and/or **Nb**, and having a part of Ni replaced with Co and Cr for .apprx.50 atomic% total. The **diffusion** barrier preferably has a low mismatch of thermal expansion with both the superalloy substrate and the high-Al protective coating, and can be applied by existing techniques.

IT Turbines
(blades, superalloy, coating of; **diffusion** barrier on turbine blades of Ni superalloy with ceramic top coating)

IT **Diffusion** barrier
Thermal barrier coatings
(on superalloy; **diffusion** barrier on turbine blades of Ni superalloy with ceramic top coating)

IT Nickel **alloy**, base
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(coating of; **diffusion** barrier on Ni-superalloy turbine blades with ceramic top coating)

IT 7429-90-5, Aluminum, uses
RL: MOA (Modifier or additive use); USES (Uses)
(coating with; **diffusion** barrier on Ni-superalloy turbine blades with ceramic top coating)

IT 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-15-5, Rhenium, uses 7440-18-8, Ruthenium, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses
RL: MOA (Modifier or additive use); USES (Uses)
(interlayer with; **diffusion** barrier on Ni-superalloy turbine blades with ceramic top coating)

IT 12018-26-7 12035-75-5 12052-61-8 12610-51-4 12685-64-2 55224-49-2, Chromium 65, rhenium 35 (atomic) 77506-66-2, Ruthenium 50, zirconium 50 (atomic) 77592-44-0, Hafnium 50, ruthenium 50 (atomic) 81497-69-0, Platinum 40, rhenium 60 (atomic) 123590-45-4, Chromium 85, ruthenium 15 (atomic) 127907-68-0 128682-76-8 366476-01-9 366476-02-0 366476-03-1 366476-04-2 366476-05-3 366476-06-4 366476-07-5 366476-08-6 366476-09-7 366476-10-0 366476-11-1 366476-12-2 366476-14-4 366476-16-6 366476-18-8 366476-19-9 366476-20-2
RL: TEM (Technical or engineered material use); USES (Uses)
(interlayer, on superalloy; **diffusion** barrier on Ni-superalloy turbine blades with ceramic zirconia top coating)

IT 12003-78-0, AlNi 57621-59-7 61048-41-7
RL: TEM (Technical or engineered material use); USES (Uses)
(interlayer; **diffusion** barrier on Ni-superalloy turbine blades with ceramic top coating)

IT 1314-23-4, Zirconia, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(stabilized, coating with; **diffusion** barrier on Ni-superalloy turbine blades with ceramic zirconia top coating)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 9 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:842318 CAPLUS
DOCUMENT NUMBER: 134:20263
TITLE: Cobalt base braze **alloy** and method for **diffusion** braze repair of superalloy articles
INVENTOR(S): Chesnes, Richard P.
PATENT ASSIGNEE(S): Allison Engine Company Inc., USA
SOURCE: PCT Int. Appl., 35 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000071764	A2	20001130	WO 2000-US12222	20000505
WO 2000071764	A3	20010412		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,

ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,
LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE,
SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,
ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

US 6365285	B1	20020402	US 1999-307616	19990507
AU 2000068892	A5	20001212	AU 2000-68892	20000505
EP 1207979	A2	20020529	EP 2000-957242	20000505

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, SI, LT, LV, FI, RO, MK, CY, AL

JP 2003527480	T2	20030916	JP 2000-620140	20000505

PRIORITY APPLN. INFO.:
US 1999-306968 A 19990507
US 1999-307616 A 19990507
US 1997-827723 A2 19970408
WO 2000-US12222 W 20000505

AB The **alloy** contains at least one element from the group of **Ru** and Ir; at least one element from the group of B and Si; at least one element from the group of Cr, Al, Ti, W, Mo, **Nb**, **Re**, **Hf**, Ta, **Pd**, **Pt**, Fe, Mn, C, **Zr**, and rare earth (**RE**); Ni in the amount of less the weight percent of Co, and the remaining balance - Co. In one embodiment, the **alloy** comprises: Ni 9.5-11.5, Cr 22-24, Al 0.5-2.5, Ti 0.75-2.75, W 2-4, **Re** 0.001-2, Ta 5-7, **Pt** 0-40, **Pd** 0-40, **RE** 0.001-5, C 0.05-1.05, B 0.5-2.5, Si 4-6, Co - bal., weight%. The repair mixture comprising the braze **alloy**, the base metal superalloy and an organic binder, is then heated to melt the braze **alloy**, thereby joining the base metal superalloy powder particles together, and joining the entire mixture to the region being repaired. The molten mixture is next subjected to a **diffusion** heat treatment cycle to break down undesirable boride and silicide phases and to **diffuse** the m.p. depressants into the mixture After cooling, an environmental coating selected from the group of simple aluminides, platinum aluminides and the main braze **alloy**, may be applied to the final repair composite, and this composite significantly improves the cyclic oxidation resistance of the coating compared to the properties of the superalloy base metal. The **alloy** and the method may be used in repairing superalloy articles, such as **gas** turbine engines, power generation turbines, refinery equipment, and heat exchangers.

IT Brazes
Heat exchangers
Turbines
(cobalt base braze **alloy** and method for **diffusion** braze repair of superalloy articles)

IT Superalloys
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(cobalt base braze **alloy** and method for **diffusion** braze repair of superalloy articles)

IT Brazing

(**diffusion**; cobalt base braze **alloy** and method for
diffusion braze repair of superalloy articles)

IT 309956-17-0 309956-18-1 309956-19-2 309956-20-5 309956-21-6
309956-22-7 309956-23-8
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(cobalt base braze **alloy** and method for **diffusion** braze repair of superalloy articles)

L8 ANSWER 10 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:158097 CAPLUS
DOCUMENT NUMBER: 132:169758
TITLE: Thermal barrier-type quasi-crystalline coating for protection of hot zones of **gas** turbines
INVENTOR(S): Sanchez Pascual, Agustin; Torre Albarsanz, Marcelino; Dubois, Jean Marie; Algaba Gonzalo, Juan Manuel; Archambault, Pierre; Garcia de Deblas Villanueva, Fco. Javier
PATENT ASSIGNEE(S): Instituto Nacional de Tecnica Aeroespacial "Esteban Terradas", Spain
SOURCE: Span., 12 pp.
CODEN: SPXXAD
DOCUMENT TYPE: Patent
LANGUAGE: Spanish
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
ES 2131451	A1	19990716	ES 1996-2084	19961004
ES 2131451	B1	20000216		

PRIORITY APPLN. INFO.: ES 1996-2084 19961004

AB A thermal barrier coating for metal substrates consists of a quasi-crystalline **alloy** AlaCobXcYdIe (X = Fe, Cr, Mo, Mn, Ni, **Ru**, Os, V, Mg, Zn, **Pd**; Y = W, Ti, **Zr**, **Hf**, Rh, **Nb**, Ta, Y, Si, Ge, rare earth metal; I = impurities; a ≥50; 0 ≤ b ≤ 22; 8 ≤ c ≤ 30; 0 ≤ d ≤ 4; 0 ≤ e ≤2). Preferably, a coating procedure involves deposition of (1) a **diffusion** barrier consisting of 20-60 weight% Y2O3 and balance the quasi-crystalline **alloy** and (2) deposition of the thermal barrier. The latter is stable above 700° and has a thermal diffusivity of 2.5x10-6 m2/s at ambient temperature

IT Thermal barrier coatings
(for **gas** turbines)

IT Turbines
(thermal barrier coating for)

IT 228873-01-6
RL: TEM (Technical or engineered material use); USES (Uses)
(in **diffusion** barrier and thermal barrier coatings for **gas** turbines)

IT 1314-36-9, Yttria, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(in **diffusion** barrier coating for **gas** turbines)

L8 ANSWER 11 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1997:210659 CAPLUS
DOCUMENT NUMBER: 126:202632
TITLE: Nickel-base single crystal **alloy**, surface improvement for it, and **gas**-turbine parts therefrom
INVENTOR(S): Ito, Osamu; Oohashi, Tetsuya; Myata, Hiroshi
PATENT ASSIGNEE(S): Hitachi Ltd, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09002900	A2	19970107	JP 1995-151311	19950619

PRIORITY APPLN. INFO.: JP 1995-151311 19950619

AB Title **alloy** includes a surface layer of a boride, a carbide, or a nitride. The Ni **alloy** has a surface layer comprising Cr 6.0-9.0, Al 4.5-6.0, W 2.0-12.0, Mo ≤6.0, Co 0.1-3.0, **Nb** 0.2-3.0, Ta 2.5-9.0, **Re** 0.1-4.0, **Hf** ≤3.0%, and balance Ni. The **alloy**, having ≤150-μm thickness the surface layer where B, C, or N concentration forms neg. gradient in the thickness direction toward the **alloy** surface, is also claimed. Title improvement, employing (i) N(g) plasma treatment, (ii) hydrocarbon(g) plasma treatment, or (iii) reactive **diffusion** of active B, resp., is also claimed. A nozzle and a blade for a power-generating **gas** turbine, are also claimed. The **alloy** shows excellent oxidation- and corrosion resistance and good strength at high temperature

IT Turbines
(blades; surface improvement of Ni-base single crystal **alloy** for **gas**-turbine parts with high oxidation- and corrosion resistance)

IT Hydrocarbons, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(plasma source; in plasma processing of Ni-base **alloy** surface)

IT Boronizing
Carburizing
Corrosion-resistant materials
Nitriding
(surface improvement of Ni-base single crystal **alloy** for **gas**-turbine parts with high oxidation- and corrosion resistance)

IT Nozzles
(turbine; surface improvement of Ni-base single crystal **alloy** for **gas**-turbine parts with high oxidation- and corrosion resistance)

IT 7727-37-9, Nitrogen, processes 19287-45-7, Diborane
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(plasma source; in plasma processing of Ni-base **alloy** surface)

IT 187748-32-9 187748-34-1 187748-36-3 187748-38-5 187748-40-9
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(surface improvement of Ni-base single crystal **alloy** for **gas**-turbine parts with high oxidation- and corrosion resistance)

L8 ANSWER 12 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1996:307522 CAPLUS
DOCUMENT NUMBER: 124:323132
TITLE: Heat-resistant metal composite coating from electroplating bath containing dispersed **alloy** powder
INVENTOR(S): Foster, John
PATENT ASSIGNEE(S): Baj Coatings Limited, UK
SOURCE: PCT Int. Appl., 27 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9603536	A1	19960208	WO 1995-GB1746	19950724
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9529889	A1	19960222	AU 1995-29889	19950724
AU 711870	B2	19991021		
EP 724658	A1	19960807	EP 1995-925958	19950724
EP 724658	B1	20000906		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
JP 09504341	T2	19970428	JP 1996-505581	19950724
RU 2134313	C1	19990810	RU 1996-108837	19950724
AT 196171	E	20000915	AT 1995-925958	19950724
ES 2150578	T3	20001201	ES 1995-925958	19950724

NO 9601153	A	19960321	NO 1996-1153		19960321
FI 9601304	A	19960521	FI 1996-1304		19960321
US 5833829	A	19981110	US 1996-619722		19960716
GR 3034959	T3	20010228	GR 2000-402662		20001130
PRIORITY APPLN. INFO.:			GB 1994-14858	A	19940722
			WO 1995-GB1746	W	19950724

AB The heat-resistant electroplate layer codeposited from a slurry bath contains: (a) metal matrix as Ni, Co, and/or Fe; and (b) particles of Cr-Al-M **alloy** having M as Y, Si, Ti, **Hf**, Ta, **Nb**, Mn, **Pt**, and/or rare earth metal, as a powder of nominally <15 µm size. The composite **alloy** coating is applied by electrodeposition at the low c.d. <5 mA/cm2 for the layer <50 µm thick, and shows high resistance to oxidation The process is suitable for electroplating of superalloy turbine parts in the bath with powder loading <50 g/L, followed by: (a) optional coating with **Pt**; (b) aluminizing, chromizing, or siliconizing; (c) heat treatment; and/or (d) the final coating with thermal barrier. The typical electroplate has average composition containing Cr 18.32, Al 8.25, Y 0.457%, and Co as the balance, and is applied from the Co-electroplating bath with powdered Cr-30.1 Al-1.7% Y **alloy** having particle size of 5-12 µm and the loading of 10 g/L.

IT Rare earth metals, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**alloy** powder with; composite electroplate from bath containing dispersed chromium **alloy** powder for heat-resistant coating)

IT Aluminizing
Chromizing
Siliconization
(electroplate; composite electroplate with dispersed chromium **alloy** powder finished by **diffusion** treatment)

IT Turbines
(electroplated parts; composite electroplate with dispersed chromium **alloy** powder finished by **diffusion** treatment for turbine service)

IT Electrodeposition and Electroplating
(with composite **alloy**; slurry bath containing dispersed **alloy** powder for heat-resistant electroplate composite)

IT 7429-90-5, Aluminum, processes 7439-96-5, Manganese, processes 7440-03-1, Niobium, processes 7440-21-3, Silicon, processes 7440-25-7, Tantalum, processes 7440-32-6, Titanium, processes 7440-58-6, Hafnium, processes 7440-65-5, Yttrium, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**alloy** powder with; composite electroplate from bath containing dispersed chromium **alloy** powder for heat-resistant coating)

IT 7440-47-3, Chromium, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**alloy**, powder; composite electroplate from bath containing dispersed chromium **alloy** powder for heat-resistant coating)

IT 7440-06-4, Platinum, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)

(coating layer; composite electroplate containing dispersed chromium **alloy** powder for heat-resistant layer with platinum top coating)

IT 176666-47-0
RL: TEM (Technical or engineered material use); USES (Uses)
(electroplate; composite electroplate containing dispersed chromium **alloy** powder for heat-resistant coating in **gas** -turbine service)

IT 7439-89-6, Iron, processes 7440-02-0, Nickel, processes 7440-48-4, Cobalt, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(electroplating with; composite electroplate from bath containing dispersed chromium **alloy** powder for heat-resistant coating)

IT 176666-46-9
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(powder, composite with; composite electroplate containing dispersed chromium **alloy** powder for heat-resistant coating in **gas**-turbine service)

L8 ANSWER 13 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1996:304157 CAPLUS
DOCUMENT NUMBER: 124:323134
TITLE: Heat-resistant **alloy** coating with **diffusion** and codeposition stages
INVENTOR(S): Foster, John
PATENT ASSIGNEE(S): Baj Coatings Limited, UK
SOURCE: PCT Int. Appl., 27 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9603535	A1	19960208	WO 1995-GB1745	19950724
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9529888	A1	19960222	AU 1995-29888	19950724
AU 711926	B2	19991021		
EP 724657	A1	19960807	EP 1995-925957	19950724
EP 724657	B1	19990421		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
JP 09504832	T2	19970513	JP 1995-505580	19950724
AT 179227	E	19990515	AT 1995-925957	19950724

ES 2130628	T3	19990701	ES 1995-925957	19950724
RU 2142520	C1	19991210	RU 1996-110199	19950724
NO 9601152	A	19960321	NO 1996-1152	19960321
FI 9601303	A	19960521	FI 1996-1303	19960321
US 5824205	A	19981020	US 1996-619723	19960516

PRIORITY APPLN. INFO.: GB 1994-14859 A 19940722
WO 1995-GB1745 W 19950724

AB The coating resistant to heat and oxidation is applied on **alloy** substrates by: (a) aluminizing, chromizing, or siliconizing for the base interlayer nominally 30-60 μm thick; (b) coating or electroplating with a composite layer containing Ni, Co, and/or Fe matrix with dispersed particles of CrAlM having M = Y, Si, Ti, **Hf**, Ta, **Nb**, Mn, **Pt**, and/or a rare earth metal; and (c) optionally coating with thermal barrier layer. The substrate is optionally precoated with **Pt**, **Pd**, or **Ru** prior to **diffusion** coating. The process is suitable for a composite **alloy** coating on **gas**-turbine parts, optionally with an associated heat treatment. The coating suitable for superalloy turbine blades is applied by: (a) pack aluminizing for 6 h at 900° under Ar, followed by **diffusion** heat treatment for 1 h at 1100° in vacuum and then aging for 16 h at 870°; and (b) electroplating from the Co bath containing dispersed powder (size 5-15 μm) of Cr-30.1 Al-1.7% Y **alloy**, for the total composition as Co-18.32 Cr-8.25 Al-0.457% Y. The coating thickness is nominally 12 μm thick (comparable to the maximum particle size of **alloy** powder), and the coated blade can be heat treated for 2 h at 1050° in vacuum.

IT Rare earth metals, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**alloy** containing; heat-resistant **alloy** coating with **diffusion** and codeposition stages)

IT Electrodeposition and Electroplating
(codeposition; heat-resistant **alloy** coating with **diffusion** and codeposition stages)

IT Aluminizing
Chromizing
Siliconization
(interlayer; heat-resistant **alloy** coating with **diffusion** and codeposition stages)

IT Turbines
(superalloy; heat-resistant **alloy** coating with **diffusion** and codeposition stages for turbine parts)

IT 7439-96-5, Manganese, uses 7440-03-1, Niobium, uses 7440-06-4, Platinum, uses 7440-21-3, Silicon, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-58-6, Hafnium, uses 7440-65-5, Yttrium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**alloy** containing; heat-resistant **alloy** coating with **diffusion** and codeposition stages)

IT 7439-89-6, Iron, processes 7440-02-0, Nickel, processes 7440-48-4, Cobalt, processes

RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**alloy**; heat-resistant **alloy** coating with
diffusion and codeposition stages)

IT 176666-47-0
RL: TEM (Technical or engineered material use); USES (Uses)
(electroplate, with codeposited powder; heat-resistant **alloy**
coating with **diffusion** and codeposition stages)

IT 7440-05-3, Palladium, processes 7440-18-8, Ruthenium, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(interlayer; heat-resistant **alloy** coating with
diffusion and codeposition stages)

IT 176666-46-9
RL: TEM (Technical or engineered material use); USES (Uses)
(powder, electroplate with codeposited; heat-resistant **alloy**
coating with **diffusion** and codeposition stages)

L8 ANSWER 14 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:172646 CAPLUS
DOCUMENT NUMBER: 124:239027
TITLE: Compatibility of 31 metals, alloys and coatings with static Pb-17Li eutectic mixture
AUTHOR(S): Feuerstein, H.; Grabner, H.; Oschinski, J.; Beyer, J.; Horn, S.; Horner, L.; Santo, K.
CORPORATE SOURCE: Projekt Kernfusion, Hauptabteilung Ingenieurtechnik, Germany
SOURCE: Wissenschaftliche Berichte - Forschungszentrum Karlsruhe (1995), FZKA 5596, 161 pp
CODEN: WBFKF5; ISSN: 0947-8620
DOCUMENT TYPE: Report
LANGUAGE: English

AB The compatibility of 31 metals, alloys and coatings with static eutectic mixture Pb-17Li was investigated in more than 300 tests. Most of the results have not been published before. Wetting has no influence on dissoln. rates and is discussed in detail. Metals can be divided into three groups: (1) most stable refractory ones including **Nb**, Ta, Mo, **Re** and W, (2) ferritic steels, Be, Fe, and V, and (3) unstable Al, Ti, **Zr**, Y, U and their alloys. Temperature functions for solubilities in Pb-17Li were obtained and the results are in good agreement with a theor. work of Guminski. The solubilities of Al, **Zr**, Y and U are remarkable high while those of the refractories are low. Also, the solubility of Pb in solid Ti was determined, adding new data points to the phase diagram. Because of the effect of mass transfer between dissimilar metals, **diffusion** coeffs. in Pb-17Li could be calculated from dissoln. rates and solubilities. Most reliable are the temperature functions for Be, Al, Fe and V. Those for Ti, **Zr** and U are influenced by the formation of compds. All values are in an expected range, but not all effects can be explained. Different kinds of reaction zones were found on surfaces. New is a very thin "chemical reaction zone", identified for several metals during sample cleaning. It is probably formed as a first step before grain boundary attack of the eutectic. The

following new intermetallic compds. were identified: Ti2Pb and Ti3Pb2, UPb4, YPb4 and Zr4Pb. The compound Ti3Pb2 was investigated in detail. Lead and titanium can be replaced by other metals. With Y and U, there was even a reaction with lead in the **gas** phase above the eutectic. Other metals were embrittled in this area. Generally, alloys are not more stable than their base metals. Leaching of elements from alloys and other effects were investigated. Especially with alloys, many open questions remain and more work has to be done to understand the chemical of alloys in the eutectic. Last but not least Mo coatings on getter metals were found not to be protective for the use in a blanket.

IT Wetting
(of metals, alloys and coatings with static Pb-17Li eutectic mixture)

IT Coating materials
(wetting with static Pb-17Li eutectic mixture)

IT 7429-90-5, Aluminum, properties 7439-89-6, Iron, properties 7439-98-7, Molybdenum, properties 7440-03-1, Niobium, properties 7440-15-5, Rhenium, properties 7440-25-7, Tantalum, properties 7440-32-6, Titanium, properties 7440-33-7, Tungsten, properties 7440-41-7, Beryllium, properties 7440-61-1, Uranium, properties 7440-62-2, Vanadium, properties 7440-65-5, Yttrium, properties 7440-67-7, Zirconium, properties
RL: PRP (Properties)
(compatibility with static Pb-17Li eutectic mixture)

IT 159470-36-7
RL: PRP (Properties)
(eutectic; compatibility of metals, alloys and coatings with)

IT 12597-69-2, Steel, properties
RL: PRP (Properties)
(ferritic; compatibility with static Pb-17Li eutectic mixture)

IT 174818-61-2P 174818-62-3P 174818-63-4P
RL: SPN (Synthetic preparation); PREP (Preparation)
(identified in compatibility study of metals, alloys and coatings with static Pb-17Li eutectic mixture)

L8 ANSWER 15 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:547729 CAPLUS
DOCUMENT NUMBER: 122:294684
TITLE: Absorbents for low molecular weight gaseous substances and their utilization
INVENTOR(S): Ikematsu, Masaki
PATENT ASSIGNEE(S): Nippon Oil Co Ltd, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

JP 07062402 A2 19950307 JP 1993-248416 19930830
JP 3425456 B2 20030714
PRIORITY APPLN. INFO.: JP 1993-248416 19930830

AB The absorbents, for gaseous substances having mol. weight <4, has an organic polymer layer permeable for the gaseous substance coated in a **alloy** capable of absorbing the gaseous substance. The **alloy** may contain Mg, Ca, Ti, **Zr**, V, **Nb**, $LaNi_5$, and/or **Pd**, and the polymer has higher permeability for H than for O. The absorbents are used for separating, recovering, and storing the low mol. weight gaseous substance by contacting a **gas** mixture containing 5-100 vol.5 of the low mol. weight gaseous substance at -50 to 300° and 0.5-30 Kg/cm2 to absorb the substance, which may be released from the absorbent later. The **gas** mixture may be H containing **gas** from petroleum refining.

IT Absorbents
(polymer coated **alloy** absorbents for separating and **purifying** and recovering low mol. weight gaseous substances)

IT Petroleum refining
Waste **gases**
(polymer coated **alloy** absorbents for separating hydrogen from petroleum refining waste **gases**)

IT Calcium **alloy**, nonbase
Magnesium **alloy**, nonbase
Niobium **alloy**, nonbase
Palladium **alloy**, nonbase
Titanium **alloy**, nonbase
Vanadium **alloy**, nonbase
Zirconium **alloy**, nonbase
RL: TEM (Technical or engineered material use); USES (Uses)
(polymer coated **alloy** absorbents for separating and **purifying** and recovering low mol. weight gaseous substances)

IT 1333-74-0P, Hydrogen, preparation
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PREP (Preparation); PROC (Process)
(polymer coated **alloy** absorbents for separating and **purifying** and recovering low mol. weight gaseous substances)

IT 9002-83-9, Poly(chlorotrifluoroethylene) 9002-84-0, Poly(tetrafluoroethylene) 12196-72-4 24968-79-4, Acrylonitrile-methyl acrylate copolymer 163158-52-9
RL: TEM (Technical or engineered material use); USES (Uses)
(polymer coated **alloy** absorbents for separating and **purifying** and recovering low mol. weight gaseous substances)

IT 74-82-8, Methane, miscellaneous 74-84-0, Ethane, miscellaneous 74-98-6, Propane, miscellaneous 630-08-0, Carbon monoxide, miscellaneous 7732-18-5, Water, miscellaneous 7782-44-7, Oxygen, miscellaneous 7783-06-4, Hydrogen sulfide, miscellaneous
RL: MSC (Miscellaneous)
(polymer coated **alloy** absorbents for separating hydrogen from **gas** mixts.)

L8 ANSWER 16 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1994:250987 CAPLUS
DOCUMENT NUMBER: 120:250987
TITLE: Strengthening, hardening, and joining of titanium or titanium **alloy**
INVENTOR(S): Tamaki, Akira
PATENT ASSIGNEE(S): Tamaki Gangu Kk, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06010113	A2	19940118	JP 1992-209375	19920629

PRIORITY APPLN. INFO.: JP 1992-209375 19920629

AB Ti or Ti **alloy** is heat treated in a specific atmospheric to **diffuse** the atmospheric components into the Ti or Ti **alloy** to strengthen or harden it. The process is also applied to joining of Ti or Ti **alloy** parts. Preferably, an **alloy**-forming material, such as **gas**, metal, or **alloy** from Al, CO, N, Mo, **Nb**, Ta, V, Ag, Cu, Fe, Mn, Ni, Co, Cr, Pb, Si, W, **Zr**, Sn, Zn, Sb, **Au**, Ag, and Ti, is placed or coated on suitably molded Ti or Ti **alloy** materials and heat treated.

IT Welding
(**diffusion**, of titanium or titanium **alloy**, simultaneous strengthening and hardening in)

IT titanium **alloy**, base
RL: PROC (Process)
(strengthening and hardening of, by element **diffusion**)

IT 12070-08-5, Titanium carbide (TiC) 13463-67-7, Titania, uses 25583-20-4, Titanium nitride 80493-01-2, Aluminum 60, vanadium 40 154597-07-6
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**diffusion** treatment of titanium or titanium **alloy** with, for strengthening and hardening)

IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses
RL: USES (Uses)
(in strengthening and hardening of titanium or titanium **alloy** by simultaneous **diffusion** of oxygen and carbon)

IT 7440-32-6, Titanium, miscellaneous
RL: MSC (Miscellaneous)
(strengthening and hardening of, by element **diffusion**)

IT 7440-44-0, Carbon, uses 7782-44-7, Oxygen, uses
RL: PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(thermal **diffusion** of, in titanium or titanium **alloy**, strengthening and hardening by)

L8 ANSWER 17 OF 25 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1993:504886 CAPLUS
DOCUMENT NUMBER: 119:104886
TITLE: The electrocatalytic oxidation of ethylene and methane, and reduction of oxygen on **gas-diffusion** electrodes made of amorphous nickel-valve metal-platinum group metal alloys
AUTHOR(S): Shimada, Toshiaki; Kawashima, Asahi; Habazaki, Hiroki; Asami, Katsuhiko; Hashimoto, Koji
CORPORATE SOURCE: Inst. Mater. Res., Tohoku Univ., Sendai, Japan
SOURCE: Science Reports of the Research Institutes, Tohoku University, Series A: Physics, Chemistry, and Metallurgy (1993), 38(1), 63-75
CODEN: SRTAA6; ISSN: 0040-8808
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Exploratory work was done on the performance of electrocatalytic reduction of O2 and anodic oxidation of ethylene and methane on the **gas-diffusion** electrodes prepared from amorphous alloys containing 1 atomic % **Pt** group elements. **Gas-diffusion** electrodes were made by coating the mixture of catalysts prepared by immersion in 46% **HF** from melt-spun ribbon shaped amorphous alloys, C black, polytetrafluoroethylene and sugar, and subsequent baking in N **gas**. The electrode made of catalyst prepared from amorphous Ni-**Nb** **alloy** containing **Pt** and **Ru** was the most active for electrocatalytic reduction of O2. For electrooxidn. of ethylene and methane, amorphous Ni-valve metal **alloy** containing only **Pt** possesses higher activity in comparison to the electrode made of **Pt** black powder.

IT Carbon black, uses
RL: USES (Uses)
(in fabrication of **gas diffusion** electrodes containing alloys)

IT Carbohydrates and Sugars, uses
RL: USES (Uses)
(in fabrication of **gas diffusion** electrodes containing metal and alloys)

IT Oxidation, electrochemical
(of methane and ethylene on **gas diffusion** electrodes, electrode composition effect on)

IT Reduction, electrochemical
(of oxygem on **gas-diffusion** electrode with different **alloy** composition)

IT Oxidation catalysts
(electrochem., metal and alloys, in **gas-diffusion** electrodes, for methane and ethylene)

IT Reduction catalysts
(electrochem., metal and alloys, in **gas-diffusion** electrodes, for oxygen)

IT Electrodes
(**gas-diffusion**, fabrication of, **alloy**
composition effect on properties of)
IT 7727-37-9, Nitrogen, uses
RL: USES (Uses)
(baking in, in fabrication of **gas diffusion**
electrodes containing alloys)
IT 7664-93-9, Sulfuric acid, uses
RL: USES (Uses)
(electrocatalytic reduction of oxygen and oxidation of methane and ethylene on
gas diffusion electrodes in solns. containing)
IT 7440-06-4, Platinum, uses
RL: USES (Uses)
(**gas diffusion** electrode containing black, for oxygen
reduction and methane and ethylene oxidation)
IT 149178-05-2, Nickel 25, platinum 72, zirconium 3 (atomic) 149178-06-3, Nickel 25, platinum 68, titanium 7 (atomic) 149178-07-4, Nickel 23, platinum 68, tantalum 9 (atomic) 149178-08-5, Nickel 20, niobium 11, platinum 69 (atomic) 149178-09-6, Nickel 15, niobium 8, palladium 77 (atomic) 149178-10-9, Nickel 18, niobium 6, rhodium 76 (atomic) 149178-11-0, Nickel 28, niobium 6, ruthenium 66 (atomic) 149178-12-1, Iridium 62, nickel 27, niobium 11 (atomic) 149178-13-2, Nickel 20, palladium 78, zirconium 2 (atomic) 149178-14-3, Nickel 26, rhodium 70, zirconium 4 (atomic) 149178-15-4, Nickel 43, ruthenium 55, zirconium 2 (atomic) 149178-16-5, Iridium 61, nickel 34, zirconium 5 (atomic) 149178-17-6, Nickel 18, niobium 12, palladium 32, platinum 38 (atomic) 149178-18-7, Nickel 20, niobium 9, platinum 36, rhodium 35 (atomic) 149178-19-8, Nickel 21, niobium 11, platinum 43, ruthenium 25 (atomic) 149178-20-1, Iridium 33, nickel 23, niobium 12, platinum 32 (atomic) 149178-21-2, Nickel 17, niobium 3, palladium 41, rhodium 39 (atomic) 149178-22-3, Nickel 17, niobium 5, palladium 40, ruthenium 38 (atomic) 149178-23-4, Iridium 36, nickel 17, niobium 10, palladium 37 (atomic) 149178-24-5, Nickel 39, palladium 26, platinum 33, zirconium 2 (atomic) 149178-25-6, Nickel 20, platinum 38, rhodium 40, zirconium 2 (atomic) 149178-26-7 149178-27-8 149178-28-9, Nickel 19, platinum 79, zirconium 2 (atomic) 149178-29-0, Nickel 31, platinum 68, zirconium 1 (atomic) 149178-30-3, Nickel 34, platinum 63, zirconium 3 (atomic) 149178-31-4, Cobalt 0.4, platinum 93, zirconium 6 (atomic) 149178-32-5, Iron 7, platinum 90, zirconium 3 (atomic)
RL: PRP (Properties)
(**gas diffusion** electrode containing, for oxygen reduction
and methane and ethylene oxidation)
IT 7664-39-3, Hydrofluoric acid, uses
RL: USES (Uses)
(in fabrication of **gas diffusion** electrodes containing
metal and alloys)
IT 9002-84-0, Polytetrafluoroethylene
RL: PRP (Properties)
(in fabrication of **gas diffusion** electrodes containing
metal and alloys)